SONY

DIGITAL VIDEOCASSETTE RECORDER

DSR-70/70P

i.LINK/DV INPUT/OUTPUT BOARD

DSBK-140

SDTI (QSDI) INPUT/OUTPUT BOARD

DSBK-150

SDI INPUT/OUTPUT BOARD

DSBK-160

ANALOG COMPONENT INPUT/OUTPUT BOARD

DSBK-170

DUAL VIDEO INPUT BOARD

DSBK-180/180P

SERVICE MANUAL

Vol. 1 (1st Edition)

DVCAM™

MANUAL STRUCTURE

Purpose of this manual

This manual is the Service Manual Vol. 1 of the digital videocassette recorder DSR-70/70P and the option boards i.LINK/DV Input/Output Board DSBK-140, SDTI (QSDI) Input/Output Board DSBK-150, SDI Input/Output Board DSBK-160, Analog Component Input/Output Board DSBK-170, Dual Video Input Board DSBK-180/180P.
This manual contains the maintenance information of this equipment, and servicing information necessary for parts replacement and adjustments.

Related manuals

In addition to this Service Manual Vol. 1, the following manuals are provided.

- **Operating Instructions**

  DSR-70/70P (Supplied with equipment)

  Parts number : 3-865-064-11 (English, for UC,CE)
  3-865-064-21 (French, for UC,CE)
  3-865-064-31 (German, for CE)
  3-865-064-41 (Italian, for CE)

  DSBK-140 (Supplied with Model DSBK-140)

  Part number : 3-865-065-01

  DSBK-150 (Supplied with Model DSBK-150)

  Part number : 3-865-066-01

  DSBK-160 (Supplied with Model DSBK-160)

  Part number : 3-865-067-01

  DSBK-170 (Supplied with Model DSBK-170)

  Part number : 3-865-068-01

  DSBK-180/180P (Supplied with Model DSBK-180/180P)

  Part number : 3-865-069-01

  Explains how to operate this equipment.

- **Service Manual Vol. 2 (Not supplied with equipment)**

  Part number : 9-955-163-21

  Contains the semiconductor pin assingnments, parts lists, block diagrams, board layouts and schematic diagrams.

Contents

The sections covered in the manual are summarized below to give you a general understanding of the manual.

SECTION 1 OPERATING INSTRUCTION

Describes the contents of the operating instructions.

SECTION 2 SERVICE OVERVIEW

Describes the replacement of the parts, the locations of the main parts and boards, notes and so on.

SECTION 3 ERROR MESSAGES

Describes the error messages.

SECTION 4 MAINTENANCE MENU

Describes the maintenance menu.
(This section will be available as a supplement.)

SECTION 5 PERIODIC INSPECTION AND MAINTENANCE

Describes the periodic inspection and cleaning procedure.

SECTION 6 REPLACEMENT OF MECHANICAL PARTS

Describes the replacement procedures and adjustment after replacement.

SECTION 7 TAPE PATH ADJUSTMENT

Describes the adjustment procedures of tape path system.

SECTION 8 ELECTRICAL ALIGNMENT

Describes the electrical adjustment of each board.

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TABLE OF CONTENTS

1. OPERATING INSTRUCTIONS

2. SERVICE OVERVIEW

2-1. Power Supply 2-1
2-2. Connectors and Cables 2-2
2-3. Input/Output Signals of Connectors 2-3
2-4. Locations of Main Parts and Circuit 2-8
2-4-1. Printed Circuit Board Location Diagram and Circuit Configuration 2-8
2-4-2. Main Mechanical Parts 2-10
2-4-3. Locations and Functions of Sensors 2-12
2-5. Functions of Record Proof Hole and Record Proof Plug of Cassette 2-14
2-6. Removal and Attachment of Cabinets 2-15
2-6-1. Battery Panel Assembly 2-15
2-6-2. Top Frame Assembly 2-15
2-6-3. Bottom Plate Assembly 2-15
2-6-4. Rear Panel Assembly 2-17
2-6-5. Control Panel Assembly 2-17
2-7. Replacement of Main Parts 2-19
2-7-1. Back Light 2-19
2-7-2. LCD Unit 2-21
2-7-3. Jog/Shuttle Dial 2-21
2-7-4. Cassette Compartment Assembly 2-22
2-7-5. Mechanism Chassis Assembly 2-23
2-7-6. DC Fan 2-23
2-8. Removal and Attachment of the Circuit Boards 2-24
2-8-1. Plug-in Boards 2-24
2-8-2. CP-326 Board 2-24
2-8-3. CP-325 Board 2-25
2-8-4. DC-97 Board 2-25
2-8-5. RE-159 Board 2-26
2-8-6. DAP-21 Board 2-27
2-8-7. RP-105 Board 2-27
2-8-8. DDE-13 Board 2-28
2-8-9. DR-364 Board 2-29
2-8-10. MB-804 Board 2-30
2-8-11. KY-433 Board 2-32
2-8-12. DP-290 Board 2-33
2-9. On-Board Switch and Slit Land Setting 2-34
2-10. On-Board Indicator Description 2-39
2-11. How to Eject a Cassette Tape when Tape has Slack (Manual Eject) 2-41
2-12. Head Cleaning when Head Clogging Occurs 2-44
2-13. Operating the VCR without a Cassette Tape 2-44
2-14. On Power Protection Circuit 2-46
2-14-1. Resetting Circuit Breaker 2-46
2-14-2. On IC Link 2-46
2-15. On Backup Battery 2-47

2-16. List of Tools and Adjustment Equipment 2-48
2-16-1. Tools 2-48
2-16-2. Measuring Equipment and Tools 2-50
2-16-2-1. Measuring Equipment and Tools 2-50
2-16-2-2. Reference Tape for Alignment (for DVR-70) 2-50
Reference Tape for Alignment (for DVR-70P) 2-51
2-17. Notes on Repair Parts 2-52
2-17-1. Flexible Card Wire Replacement 2-52
2-17-2. EEPROM Initialization and Adjustment Procedure 2-55
2-17-2-1. Initialization and Adjustment Procedure 2-55
2-18. System Phase Adjustment when External Editing Control Unit is Connected 2-55

3. ERROR MESSAGES

3-1. Alarm Display 3-1
3-1-1. Alarm Display when the Main Power is Turned On 3-1
3-2. Error Codes 3-3
3-2-1. Main Codes and Sub Codes 3-5
3-2-2. Display of Previously Detected Error Codes 3-7
3-2-3. Error Codes 3-8
3-2-4. Possible Causes of Errors 3-13

4. MAINTENANCE MENU

4-1. Menu Structure 4-1
4-2. How to Operate Maintenance Menu 4-2
4-2-1. Location and Function of Switches 4-2
4-2-2. How to Enter the Maintenance Menu 4-2
4-2-3. How to Exit the Maintenance Menu 4-2
4-3. Contents of Maintenance Menu 4-3
4-3-1. Menu Data Control 4-3
4-3-2. Servo Check 4-6
4-3-3. Servo Adjust 4-19
4-3-4. Tape Path Adjust 4-26
4-3-5. Electrical Adjust 4-27
4-3-6. Service Support 4-38
4-3-7. Others 4-40

5. PERIODIC INSPECTION AND MAINTENANCE

5-1. Periodic Inspection List 5-1
5-2. Hours Meter 5-2
5-3. Maintenance upon Completion of Repair 5-4
5-3-1. Video Head Cleaning Procedure 5-4
5-3-2. Tape Running Path Cleaning 5-5

6. REPLACEMENT OF MECHANICAL PARTS

6-1. General Information on Parts Replacement and Adjustment 6-1
6-1-1. Preparation Before Starting Parts Replacement 6-1
6-1-2. Drum Assembly 6-1
6-1-3. Grease 6-1
6-1-4. Tightening Torque and Handling of Washers 6-2
6-2. Drum Assembly Replacement 6-3
6-3. DC Motor SRD13A/J-RP (Reel Motor S) Replacement 6-5
6-4. DC Motor SRD12A/J-RP (Reel Motor T) Replacement 6-7
6-5. Supply and Takeup Brake Assembly Replacement 6-9
6-6. Brake Base Assembly Replacement 6-10
6-7. Brake Solenoid Replacement 6-12
6-8. Pinch Roller Replacement 6-13
6-9. Elevator Cam Replacement 6-14
6-10. Pinch Solenoid Assembly Replacement 6-15
6-11. Supply Tension Regulator Assembly Replacement 6-16
6-11-1. Guide Height/Slantness Adjustment 6-17
6-12. T Drawer Arm Assembly Replacement 6-19
6-13. S4 Arm Assembly Replacement 6-20
6-14. T4 Arm Assembly Replacement 6-21
6-15. Rail Assembly Replacement 6-22
6-16. Shuttle (Left) Assembly Replacement 6-25
6-17. Shuttle (Right) Assembly Replacement 6-26
6-18. Capstan Motor Replacement 6-27
6-19. Threading Motor Replacement 6-28
6-20. Reel Shift Motor Assembly Replacement 6-29
6-21. MIC Holder Assembly Replacement 6-30

7. TAPE PATH ADJUSTMENT

7-1. General Information for Tape Path Adjustment 7-1
7-2. Tape Path Adjustment 7-6
7-3. RF Switching Position Adjustment 7-9
7-4. Confirmation of Tape Path Adjustment 7-12
7-5. Search Forward (×5) Waveform Check 7-13
7-6. Search Reverse (×5) Waveform Check 7-14
7-7. RF Waveform Buildup Check 7-15
7-8. Tape Curl Check at Tape Guides 7-16
7-9. Check by Playing Back Self-Recorded Tape 7-17

8. ELECTRICAL ALIGNMENT (for NTSC)

8-1. Electrical Alignment Overview (for NTSC) ..... 8-1 (N)
8-1-1. List of Adjustment Parts ..... 8-1 (N)
8-1-2. Measuring Equipment and Tools ..... 8-2 (N)
8-1-3. Reference Tape for Alignment ..... 8-2 (N)

8-2. Adjustment Procedure (for NTSC) ..... 8-3 (N)
8-2-1. System / Audio Adjustment ..... 8-3 (N)
8-2-1-1. Character Position Adjustment ..... 8-3 (N)
8-2-1-2. Audio PB Level Adjustment ..... 8-4 (N)
8-2-1-3. Audio EE Level Adjustment ..... 8-4 (N)
8-2-1-4. Audio AGC Adjustment ..... 8-4 (N)
8-2-2. Video Adjustment ..... 8-5 (N)
8-2-2-1. INT SC Frequency Adjustment ..... 8-6 (N)
8-2-2-2. HCK Check ..... 8-6 (N)
8-2-2-3. COMPONENT Y OUT Level Adjustment ..... 8-7 (N)
8-2-2-4. COMPONENT B-Y OUT Level Adjustment ..... 8-7 (N)
8-2-2-5. COMPONENT R-Y OUT Level Adjustment ..... 8-8 (N)
8-2-2-6. Setup off Chroma Level Check ..... 8-8 (N)
8-2-2-7. S VIDEO OUT Y Level Check ..... 8-9 (N)
8-2-2-8. VIDEO OUT 1 Y/SYNC Level Adjustment ..... 8-9 (N)
8-2-2-9. VIDEO OUT 2 Y Level Adjustment ..... 8-10 (N)
8-2-2-10. ENC SC Leak Adjustment ..... 8-11 (N)
8-2-2-11. U-V Axis (B-Y, R-Y) Phase Adjustment ..... 8-12 (N)
8-2-2-12. PB VIDEO OUT 1 Chroma/Burst Level Adjustment ..... 8-13 (N)
8-2-2-13. PB S VIDEO Chroma Level Adjustment ..... 8-14 (N)
8-2-2-14. PB Composite C/C Delay Adjustment ..... 8-14 (N)
8-2-2-15. PB Composite Y/C Delay Adjustment ..... 8-15 (N)
8-2-2-16. PB Component Y/C Delay Adjustment ..... 8-16 (N)
8-2-2-17. PB INT SCH Phase Adjustment ..... 8-17 (N)
8-2-2-18. REF. CF Phase Adjustment ..... 8-18 (N)
8-2-2-19. REF. VIDEO OUT Sync/Burst Level Adjustment ..... 8-20 (N)
8-2-2-20. REF. Internal SCH Adjustment ..... 8-20 (N)
8-2-2-21. SPCK Error Adjustment ..... 8-21 (N)
8-2-2-22. Composite 4Fsc PLL DC Check/Adjustment ..... 8-22 (N)
8-2-2-23. REC Y Clamp Level Adjustment ..... 8-23 (N)
8-2-2-24. REC Y Level Adjustment ..... 8-24 (N)
8-2-2-25. REC Component R-Y Level Adjustment ..... 8-25 (N)
8-2-2-26. REC Component B-Y Level Adjustment ..... 8-25 (N)
8-2-2-27. REC A/D Y Level Adjustment ..... 8-26 (N)
8-2-2-28. REC Composite Y Level Adjustment ..... 8-27 (N)
8-2-2-29. REC Composite Chroma Level Adjustment ..... 8-28 (N)
8-2-2-30. REC S VIDEO Chroma Level Adjustment ..... 8-28 (N)
8-2-2-31. REC Composite Y/C Delay Adjustment ..... 8-29 (N)
8-2-2-32. REC Component Y/C Delay Adjustment ..... 8-30 (N)
8-2-2-33. REC S VIDEO Y/C Delay Adjustment ..... 8-31 (N)
8-2-2-34. Sync Phase Adjustment ..... 8-32 (N)
8-2-2-35. SC Phase Adjustment ..... 8-34 (N)
8-2-3. SDTI (SDI-39 Board/DSBK-150) ..... 8-35 (N)
8-2-3-1. Free Run Adjustment ..... 8-35 (N)
8-2-4. SDI (SDI-38 Board/DSBK-160) ..... 8-35 (N)
8-2-4-1. Free Run Adjustment ..... 8-35 (N)

8. ELECTRICAL ALIGNMENT (for PAL)

8-1. Electrical Alignment Overview (for PAL) ..... 8-1 (P)
8-1-1. List of Adjustment Parts ..... 8-1 (P)
8-1-2. Measuring Equipment and Tools ..... 8-2 (P)
8-1-3. Reference Tape for Alignment ..... 8-2 (P)
8-2. Adjustment Procedure (for PAL) ..... 8-3 (P)
8-2-1. System / Audio Adjustment ..... 8-3 (P)
8-2-1-1. Character Position Adjustment ..... 8-3 (P)
8-2-1-2. Audio PB Level Adjustment ..... 8-4 (P)
8-2-1-3. Audio EE Level Adjustment ..... 8-4 (P)
8-2-1-4. Audio AGC Adjustment ..... 8-4 (P)
8-2-2. Video Adjustment ..... 8-5 (P)
8-2-2-1. INT SC Frequency Adjustment ..... 8-6 (P)
8-2-2-2. HCK Check ..... 8-6 (P)
8-2-2-3. COMPONENT Y OUT Level Adjustment ..... 8-7 (P)
8-2-2-4. COMPONENT B-Y OUT Level Adjustment ..... 8-7 (P)
8-2-2-5. COMPONENT R-Y OUT Level Adjustment ..... 8-8 (P)
8-2-2-6. S VIDEO OUT Y Level Check ..... 8-8 (P)
8-2-2-7. VIDEO OUT 1 Y/SYNC Level Adjustment ..... 8-9 (P)
8-2-2-8. VIDEO OUT 2 Y Level Adjustment ..... 8-9 (P)
8-2-2-9. ENC SC Leak Adjustment ..... 8-10 (P)
8-2-2-10. U-V Axis (B-Y, R-Y) Phase Adjustment ..... 8-11 (P)
8-2-2-11. PB VIDEO OUT 1 Chroma/Burst Level Adjustment ..... 8-12 (P)
8-2-2-12. PB S VIDEO Chroma Level Adjustment ..... 8-13 (P)
8-2-2-13. PB Composite C/C Delay Adjustment ..... 8-13 (P)
8-2-2-14. PB Composite Y/C Delay Adjustment ..... 8-14 (P)
8-2-2-15. PB Component Y/C Delay Adjustment ..... 8-15 (P)
8-2-2-16. PB INT SCH Phase Adjustment ..... 8-16 (P)
8-2-2-17. REF. CF Phase Adjustment ..... 8-17 (P)
8-2-2-18. REF. VIDEO OUT Sync/Burst Level Adjustment ..... 8-19 (P)
8-2-2-19. REF. Internal SCH Adjustment ..... 8-19 (P)
8-2-2-20. SPCK Error Adjustment ..... 8-20 (P)
8-2-2-21. Composite 4Fsc PLL DC Check/Adjustment ..... 8-21 (P)
8-2-2-22. REC Y Clamp Level Adjustment ..... 8-22 (P)
8-2-2-23. REC Y Level Adjustment ..... 8-23 (P)
8-2-2-24. REC Component R-Y Level Adjustment ..... 8-24 (P)
8-2-2-25. REC Component B-Y Level Adjustment ..... 8-24 (P)
8-2-2-26. REC A/D Y Level Adjustment ..... 8-25 (P)
8-2-2-27. REC Composite Y Level Adjustment ..... 8-26 (P)
8-2-2-28. REC Composite Chroma Level Adjustment ..... 8-27 (P)
8-2-2-29. REC S VIDEO Chroma Level Adjustment ..... 8-27 (P)
8-2-2-30. REC Composite Y/C Delay Adjustment ..... 8-28 (P)
8-2-2-31. REC Component Y/C Delay Adjustment ..... 8-29 (P)
8-2-2-32. REC S VIDEO Y/C Delay Adjustment ..... 8-30 (P)
8-2-2-33. Sync Phase Adjustment ..... 8-31 (P)
8-2-2-34. SC Phase Adjustment ..... 8-33 (P)

8-2-3. SDTI (SDI-39 Board/DSBK-150) ..... 8-34 (P)
8-2-3-1. Free Run Adjustment ..... 8-34 (P)
8-2-4. SDTI (SDI-38 Board/DSBK-160) ..... 8-34 (P)
8-2-4-1. Free Run Adjustment ..... 8-34 (P)

SONY

3-865-064-**11(1)**

Digital Videocassette Recorder

Operating Instructions
Before operating the unit, please read this manual thoroughly and retain it for future reference.

DVCAM™

DSR-70/70P

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SECTION 1
OPERATING INSTRUCTIONS

This section is extracted from operation manual.

Owner's Record

The model and serial numbers are located in the rear. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No._____ Serial No._____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

For customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

Caution

Television programrms, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

Table of Contents

Chapter1

Overview

Features **9**
Location and Function of Parts **13**
Display Panel 14
Control Panel 16
Front Control Section 22
Top Panel 23
Rear Panel 24

Chapter2

Power Preparations and Connections

Power Preparations **29**
Usable Batteries 29
Using the BP-L60(A)/L90(A) Battery Pack 30
Using the BP-90(A) Battery Pack 31
Using AC Power 32
System Configuration **35**
Connections for Cut Editing Using Two DSR-70/70P Units — i.LINK Connections (Optional DSBK-140 Required) **36**

Chapter3

Editing

Sequence of Editing Operations **37**
Settings for Editing **38**
Recorder Settings 38
Player Settings 41
Handling Cassettes **43**
Loading/Ejecting Cassettes 45
Selecting an Edit Mode **47**
Assemble Editing 47
Insert Editing 48
Finding Edit Points — Search **49**

(Continued)

Table of Contents

Chapter3

Editing (Continued)

Setting Edit Points 50
Setting Edit Points 50
Checking Edit Points 52
Cuing Up Edit Points 53
Previewing Edit Results 54
Modifying Edit Points 55
Setting Edit Points Using the Recorder Only 56
Executing an Edit 57
Outline of Editing Operations 57
Starting an Edit 58
Redoing an Edit 59

Chapter4

Time Data and Sub LCD Menu

Setting Time Data 61
Information Displayed on the LCD Monitor 61
Setting an Initial Value and Recording Timecode 63
Synchronizing the Internal Timecode Generator With an External Signal — External Lock 65
Sub LCD Menu Display and Settings –– Making Operating Mode and Video/Audio Signal Settings 66
Sub LCD Menu Home Page and Sub LCD Operation Buttons 66
Sub LCD Menu Basic Operations 68
Input and Output Settings for Video and Audio Signals –– Sub LCD Menu 70
Making Settings in the Audio Settings Pages 70
Making Settings in the Audio Settings Subpages 71
Making Settings in the Video Settings Pages 72
General Settings Pages of the Sub LCD Menu 73

Chapter5

Special Editing and Recording/Playback

Special Editing 75
Quick Editing 75
Continuous Editing 77
Manual Editing 78
Recording 79
Preparations for Recording 79
Recording Operation 79
Sequential Recording Using Two Units 80
Parallel Recording Using Two Units 81
Two-Input Switched Video Recording (Optional DSBK-180/180P Required) 82
Digitally Dubbing Signals in DVCAM Format (Optional DSBK-140 or DSBK-150 Required) 85
Playback 88
Preparations for Playback 88
Playback Operation 88
Two-Unit Synchronous Playback 89

Chapter6

ClipLink Operation

Overview of ClipLink Operation 91
Displaying ClipLink Log Data 92
Detailed Data Display 92
Cuing Up to Mark IN/Cue Points 93
Cuing Up to Any Desired Position 93
Cuing Up to Adjacent Mark IN/Cue Points 93
Rewriting ClipLink Log Data 94
Changing the Reel Number 94
Changing Mark IN/OUT Points 94
Changing the OK/NG Status 95
Adding to/Deleting From ClipLink Log Data 97
Adding Mark IN/OUT Points 97
Deleting Mark IN/OUT Points 97
Automatically Creating New ClipLink Log Data 99

Table of Contents

Chapter7

Setup Menu

Menu System Configuration 101
Basic Menu 101
Items in the Basic Menu 101
Basic Menu Operations 104
Extended Menu 106
Items in the Extended Menu 106
Extended Menu Operations 112

Chapter8

Connections and Settings

Reference Video Signals for Analog Signal Editing 113
Connections for Cut Editing Using i.LINK Interface (Optional DSBK-140 Required) 113
Connections for Digital Nonlinear Editing Using SDTI (QSDI) Interface (Optional DSBK-150 Required) 114
Connections for Cut Editing Using SDI Interface (Optional DSBK-160 Required) 115
Settings Required When Connecting an External Editing Control Unit 115
Timecode Settings on This Unit 115
Settings on Editing Control Units 116
Connections for Component Analog Recording (Optional DSBK-170 Required) 117
Connections for Sequential Recording Using Two Units 118
Connections for Parallel Recording Using Two Units 120
Connections for Two-Unit Synchronous Playback 122
Connections for Two-Input Switched Video Recording (Optional DSBK-180/180P Required) 123
Connections for Digitally Dubbing Signals in DVCAM Format (Optional DSBK-140 or DSBK-150 Required) 124
Combining Two VCRs 125
Using the Shoulder Belt 126

Chapter9

Maintenance and Troubleshooting

Condensation 127
Head Cleaning 127
Periodic Maintenance 128
Troubleshooting 129
Error Messages 131
Alarm Messages 131

Appendixes

Specifications 135
Glossary 138

Index 141

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Chapter 1

Overview

Features

The DSR-70/70P is a 1/4-inch digital videocassette recorder using the DVCAM™ digital recording format. It uses a component video system, with separate luminance and chrominance signals and digital processing to realize a stable, high image quality.
This unit is lightweight and compact, with a color liquid crystal display and speakers, making it easy to carry, yet ideal for on-the-spot checking of recorded material.
By combining two units, you can easily assemble a cut editing system.
The unit supports the Sony-developed ClipLink™ function, improving operating efficiency when combined with a Sony EditStation™.
A range of optional interface boards is available, with support for both digital and analog systems.
The following are the principal features of the unit.

DVCAM Format

DVCAM is a professional 1/4-inch digital recording format developed by Sony from the DV 4:1:1 component digital format for home use.

High image quality and high stability

The luminance and chrominance signals are encoded separately, with a 1/5 compression, giving a stable high quality video image.
Since this is a digital system, nth-generation copies created by repeated dubbing show virtually no loss in picture quality.

Wide track

The recording track width is 15 µm, 50% wider than the 10 µm of the DV format. This ensures adequate reliability for professional use.

PCM digital audio for high sound quality

The PCM encoding method yields a high audio quality, with wide dynamic range and high signal-to-noise ratio.
There are two recording modes: two-channel mode (48-kHz sampling and 16-bit quantization), which offers sound quality equivalent to the DAT (Digital Audio Tape) format, or four-channel (32-kHz sampling and 12-bit quantization).

Playback compatibility with DV format

A DV cassette recorded on a DV format VCR can be played back on this unit. (It is not possible, however, to play back cassettes recorded in LP mode.)

Support for two cassette sizes

There are two sizes of DVCAM cassette: standard and mini. You can use either size with this unit.

- The reel mechanism automatically adjusts to the size of cassette inserted.
- The capacity of a standard cassette is 184 minutes of recording/playback, and that of a mini cassette is 40 minutes.

Variety of Interfaces

Digital interfaces (options)

The unit can use the following digital interfaces provided by optional interface boards *(see page 12)*.

- **SDTI (QSDI)**[1)]
  This interface allows video, audio and timecode signals in SDTI (QSDI) format to be transferred at normal speed between this unit and the ES-7 EditStation. (Optional DSBK-150 board)
- **SDI**[2)]
  This interface allows the unit to input or output D1 (component) digital video and audio signals. (Optional DSBK-160 board)
- **i.LINK (DV)**[3)]
  The DV input/output connector using i.LINK technology allows the unit to input and output digital video and audio signals in DV format. (Optional DSBK-140 board)

Analog interfaces

A wide range of analog interfaces is provided, allowing this unit to be connected to various video and audio devices.

- **Analog video:** Composite and S-video interfaces are provided. There is also a component interface option (DSBK-170).
- **Analog audio:** There are two input channels and two output channels. There is also support for microphone input.

Full Functionality for More Efficient Editing

This unit has a number of functions which assist in efficient and precise editing.

Support for ClipLink function

This unit accepts instructions from an EditStation, to transfer to the EditStation ClipLink log data held in the cassette memory or index pictures recorded on the tape. On the EditStation you can use these images and data to carry out editing operations efficiently.

- Displaying ClipLink log data
- Changing ClipLink log data OK/NG status
- Cuing up to Mark IN and cue points provided by ClipLink log data
- For cut editing, copying Mark IN data from ClipLink log data

For an overview of the ClipLink function, refer to the separate ClipLink Guide.

Internal timecode generator and reader

An internal timecode generator and reader enables timecode compliant with SMPTE/EBU format to be recorded and played back. This allows editing to single frame precision.
Outputting or inputting timecode (LTC) to or from an external device is also possible.

High-speed search function

You can carry out a picture search while playing back in color within the range +32 to –32 times normal speed[1)].
When controlling the unit in shuttle mode from an editor or remote control unit, you can search at any speed in the range +32 to –32 times normal speed. In jog mode a frame by frame search is possible. During playback in the range +10 to –10 times normal speed, high-speed audio playback is also possible.

Digital slow motion playback

Using the frame memory function, noiseless slow motion playback is possible at any speed in the range $+^{1}/_{2}$ to $-^{1}/_{2}$ times normal speed.

Jog audio function

When searching in jog mode at speeds between +1 to $+^{1}/_{30}$ and $-^{1}/_{30}$ to –1 times normal speed, you can monitor the audio playback. The audio signal is saved in temporary memory, and replayed according to the search speed. This allows searching on the sound track.

Internal TBC (time base corrector)

This unit has an internal digital TBC, providing a jitter-free video output even for analog editing. There are also video output level, chroma signal output level, setup level (for DSR-70), black level (for DSR-70P), and chroma phase adjustments.

Other Features

Two-Input Video Recording

With the optional DSBK-180/180P Dual Video Input Board installed, you can record, switching between the composite video input to the VIDEO INPUT connector and the composite video input to the REF. VIDEO IN connector.
The ease of switching video inputs when recording helps improve later editing efficiency.

Menu operations for functions and operating settings

To make it easier to use this unit for any particular purpose, various functions and operating settings are provided in the menu system.

Superimposing function

Timecode, operating mode, error messages, and other text information, can be superimposed on the color liquid crystal display and the analog composite video signal output.

Functions for easy maintenance

- **Self-diagnosis and alarm function:** This automatically detects incorrect operations or connections, operating faults, and so forth, and displays details of the problem, the cause, and the action to be taken, in the color liquid crystal display and the time data display.
- **Digital hours meter:** This keeps four cumulative counts of the powered on time, the drum rotation time, the tape transport time, and the number of tape threadings and unthreadings, and displays them in the color liquid crystal display and the time data display.

1) SDTI (QSDI): SDTI (Serial Data Transport Interface) is the name of a standard interface established as SMPTE 305M.
This unit uses SDTI to transmit DV data, and the input/output connectors are labled “SDTI(QSDI)”.
In indicator and menu indications, however, the “SDTI(QSDI)” name is shortened to “SDTI”.

2) SDI: Serial Digital Interface is used for transferring video signals in component digital format (D1).

3) i.LINK is a trademark of Sony Corporation and indicates that this product is in agreement with IEEE1394-1995 specifications and their revisions.

1) The positive direction refers to forward movement of the tape, and the negative direction to reverse movement.

Features

Sequential recording

Combining two DSR-70/70P units allows you to perform sequential recording from one unit to another. Using two cassettes repeatedly, the last six hours of recording is always available (using 184 minute tapes). When you renew the cassette about every 3 hours, endless recording is possible.

Compatible with wide screen aspect ratio (16:9)

The unit can record and play back aspect ratio information. When video accompanied by wide-screen aspect ratio information is recorded or played back, the unit's LCD monitor automatically switches to 16:9 mode. The video signal output from the unit also contains the aspect ratio information.

AC and DC power

This unit is equipped with V-shoe attachment, on which BP-L60/L60A/L90/L90A or BP-90/90A battery or an AC adaptor can be mounted. The unit can operate for about 120 minutes (with no optional boards installed) with BP-L90 battery mounted. For AC operation, you can connect an AC-550/550CE or AC-DN2/DN2A adaptor.

Combination of two units

Using the optional BKNW-225 Docking Kit to combine two DSR-70/70P units gives you a portable editor.

Compact and lightweight

Even though it is equipped with an LCD monitor and a speaker, the unit weighs only 5.8 kg (12 lb 12 oz). Its compact design makes it easy to carry anywhere.

Options

Optional boards

The optional boards available are as follows.

You can use any and only one of the following boards at the same time.

- **DSBK-140 i.LINK/DV Input/Output Board**
  This board enables cut editing between two DSR-70/70P units. This board also allows you to connect the unit to other equipment provided with a Sony DV connector to carry out editing or dubbing of digital video and audio signals.
- **DSBK-150 SDTI (QSDI) Input/Output Board**
  The unit fitted with this board can be connected to the ES-7 EditStation to carry out digital nonlinear editing. You can also connect the unit to the DSR-85/85P/80/80P/60/60P Digital Videocassete Recorder or Player and carry out digital editing or dubbing operation.
- **DSBK-160 SDI Input/Output Board**
  Using this board, you can connect the unit to the DNW-A25/A25P Betacam SX Digital Videocassette Recorder and carry out cut editing.
- **DSBK-170 Analog Component Input/Output Board**
  This board allows you to connect the unit to Betacam SP VCRs and carry out editing and dubbing operations.

The following board may be used in combination with any one of the above four boards.

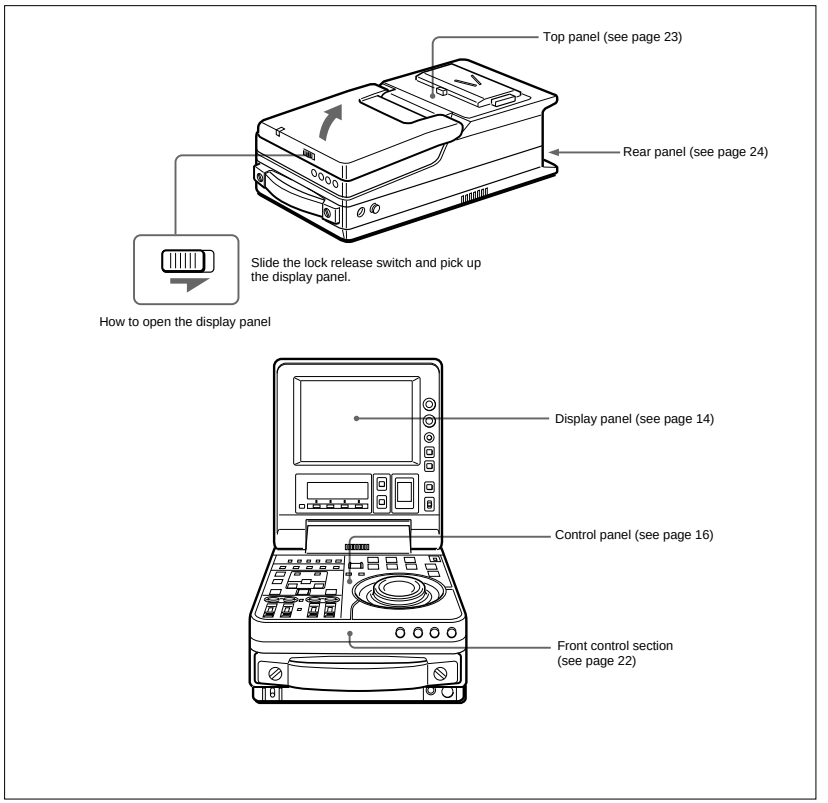
- **DSBK-180/180P Dual Video Input Board**
  This board allows two video cameras to be connected to the unit so that you may carry out video recording switching between the signals from the two cameras.

BKNW-225 Docking Kit

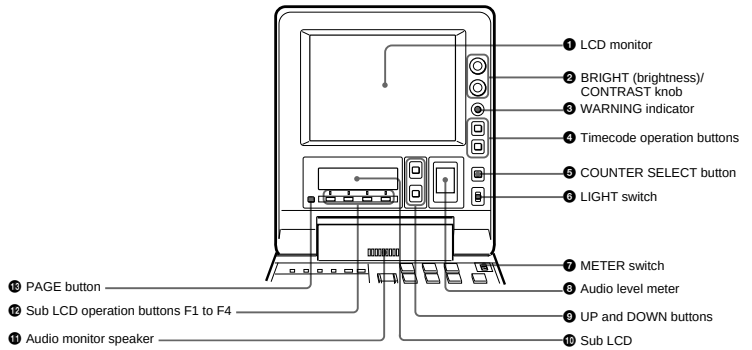
Use to combine two DSR-70/70P units.

Location and Function of Parts

This unit is comprised of the parts shown in the figure below.


Top panel (see page 23)
Rear panel (see page 24)
Slide the lock release switch and pick up the display panel.
How to open the display panel
Display panel (see page 14)
Control panel (see page 16)
Front control section (see page 22)

Display Panel


❶ LCD monitor
❷ BRIGHT (brightness)/ CONTRAST knob
❸ WARNING indicator
❹ Timecode operation buttons
❺ COUNTER SELECT button
❻ LIGHT switch
❼ METER switch
❽ Audio level meter
❾ UP and DOWN buttons
❿ Sub LCD
⓫ Audio monitor speaker
⓬ Sub LCD operation buttons F1 to F4
⓭ PAGE button

❶ LCD monitor
Displays the playback or E-E pictures[1]. Time data, status information, and setup menus, etc. are superimposed on the LCD monitor.

❷ BRIGHT (brightness)/CONTRAST knob
Adjusts the brightness and contrast of the LCD monitor ❶. Adjustments have no effect on the recorded or output video.

❸ WARNING indicator
Lights when the battery is exhausted or an error occurs.
It flashes when the end of battery power is near.

❹ Timecode operation buttons
HOLD button: Stops the progress of the timecode generator. Press this button before setting timecode or user bits to hold those values.
RESET button: Press this to reset the preset data of CNT (counter value) or TC (timecode) or UB (user bit) indication in the sub LCD ❿. Resetting the CNT value erases all edit points that have been set.
Use this button also when resetting the setup menu to its factory default settings.

For more information, see "Setting Time Data" on page 61. For information about how to reset the setup menu to its factory default settings, see the section "Resetting the menu settings to their factory default values" page 105.

❺ COUNTER SELECT button
Alternately selects CNT (counter value), TC (timecode), and UB (user bits) as the time data used in editing and displayed in the sub LCD ❿.

❻ LIGHT (backlight on/off) switch
Turns the backlights of the sub LCD ❿ and audio level meter ❽ on and off.

You can also use the LIGHTSW setting of the sub LCD menu to turn the LCD monitor power on and off. For details, see page 74.

❼ METER switch
Selects the audio channel whose level is displayed by the audio level meter ❽.
CH-1/2: Display the recording, playback, and E-E levels of audio channels 1 and 2.
CH-3/4: Display the recording, playback, and E-E levels of audio channels 3 and 4.

❽ Audio level meter
Displays the recording and playback audio levels of two (CH-1/2 or CH-3/4) of the four audio channels (CH-1 to CH-4), as selected with the METER switch ❼.

❾ UP and DOWN buttons
Press to make settings in the sub LCD menu.

For more information about the sub LCD menu, see "Sub LCD Menu Home Page and Sub LCD Operation Buttons" on page 66.

❿ Sub LCD
Displays time data, status information, remaining battery capacity, remaining tape time, sub LCD menu, setup menu and error messages.

For more information about the sub LCD menu, see "Sub LCD Menu Home Page and Sub LCD Operation Buttons" on page 66.

⓫ Audio monitor speaker
Plays the mixed audio signal of the audio channels selected with the MONITOR item in the sub LCD menu. Adjust the volume with the LEVEL knob on the front control panel. You cannot monitor sound from the speaker when headphones are connected to the HEADPHONES jack.

For more information about the MONITOR item, see page 71.

⓬ Sub LCD operation buttons F1 to F4
Select items in the sub LCD menu.

For more information about the sub LCD menu, see "Sub LCD Menu Home Page and Sub LCD Operation Buttons" on page 66.

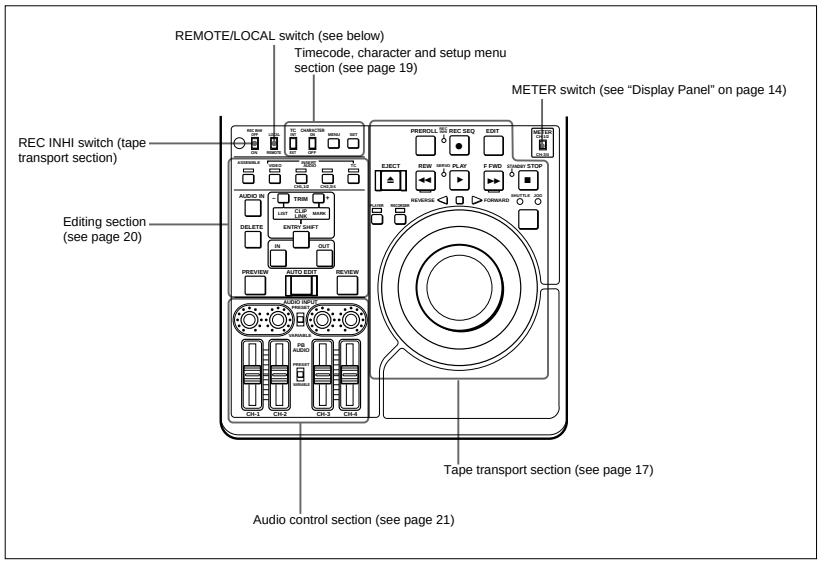
⓭ PAGE button
Switches between pages in the sub LCD menu.

For more information about the sub LCD menu, see "Sub LCD Menu Home Page and Sub LCD Operation Buttons" on page 66.

1) E-E pictures: "E-E" stands for "Electric to Electric". In E-E mode, the video and audio signals that are input to the VCR's recording circuitry do not pass through any magnetic conversion circuits but instead are output via electric circuits only. The pictures output in E-E mode are referred to as E-E pictures.

Location and Function of Parts

Control Panel


REMOTE/LOCAL switch (see below)
Timecode, character and setup menu section (see page 19)
METER switch (see “Display Panel” on page 14)
REC INHI switch (tape transport section)
Editing section (see page 20)
Tape transport section (see page 17)
Audio control section (see page 21)

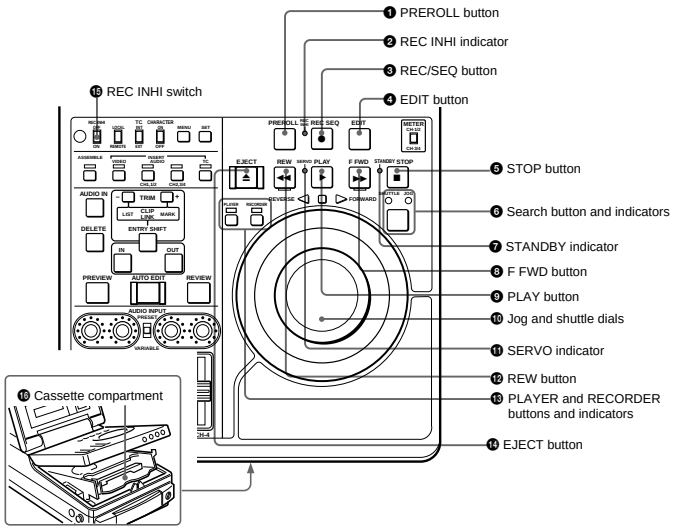
REMOTE/LOCAL switch
Selects the source for control of this unit. When two DSR-70/70P units are connected, set this switch on the player to REMOTE.

REMOTE: This unit is controlled from the device connected to the REMOTE connector. In this case, all VCR operations using this unit’s control panel are disabled except the STOP and EJECT buttons.
When combining two DSR-70/70P units as a pair of recorder and player, set the REMOTE/LOCAL switch of the player to REMOTE.

LOCAL: This unit is controlled from the control panel. Normally set the switch to this position.

When the REMOTE is selected, you can determine which tape transport control buttons on the control panel are enabled. See setup menu item 006 on page 102.

Tape transport section



❶ PREROLL button
Press to run the tape up to the preroll point (located in advance of the IN point by the amount of the preroll time). You can set the preroll time using setup menu item 001 *(page 102)*. You can set the state of the unit at the end of preroll by using setup menu item 401 *(page 108)*.
By pressing this button at the same time as the IN/OUT or AUDIO IN buttons in the editing section, you can search for a timecode set in advance and stop at that position. (The tape is cued up to the preset timecode position.)

❷ REC INHI (recording inhibit) indicator
Lights under the following situations.
• Set the REC INHI switch ⓯ to ON.
• Set the REC/SAVE switch on the cassette to SAVE.

When the REC INHI switch ⓯ is in the OFF position, then it is possible to make the REC INHI indicator flash in this state. For details, see setup menu item 107 on page 106.

❸ REC/SEQ (recording/sequence) button
Press together with the PLAY button ❾ to start recording.
When two DSR-70/70P units are combined, this button allows you to perform sequential recording from one unit to another.

For details, see “Sequential Recording Using Two Units” on page 80.

To monitor E-E mode
You can monitor input signals in E-E mode by pressing this button from stop mode. The button lights when pressed. To return to the original picture, press the STOP button ❺. You can view E-E video during playback, search, fast forward, and rewind by pressing this button.
The E-E video continues for as long as the button is kept pressed.

❹ EDIT button
Press together with the PLAY button ❾ to perform manual editing.

To monitor E-E mode
You can monitor input signals in E-E mode by pressing this button from stop mode. The button lights when pressed, and the input signals selected with the ASSEMBLE or INSERT buttons appear in E-E mode. To return to the original picture, press the STOP button ❺. You can view E-E video during playback, search, fast forward, and rewind by pressing this button. The E-E video continues for as long as the button is kept pressed.

❺ STOP button
Press this button, lighting it, to stop playback or recording. When you stop playback, the LCD monitor displays E-E or still picture playback, depending on the PB/EE setting in the sub LCD menu.
Setting setup menu item 105 to ON or LIMIT causes this button to flash when the input video signal and the reference video signal are asynchronous.

❻ Search button and indicators
Press to enter search mode. (The JOG or SHUTTLE indicator lights)
In shuttle mode, you can start playback at preset speed by rotating the shuttle dial to the desired position and pressing this button.
When setup menu item 129 is set to ON, this button functions as a pause button. You can use the pause button to make a pause during sequential recording carried out using two DSR-70/70P units.

❼ STANDBY indicator
Lights when the tape drum is rotating with tension applied (standby on). It goes out when the drum stops rotating and tension is released (standby off).
To protect the tape, the unit normally changes to standby off when stop mode continues for longer than 8 minutes. If you operate a dial or any of the tape transport buttons except STOP ❺ while the unit is in this state, the unit changes to standby on and enters the mode of the button or dial that you pressed.
Press the ENTRY/SHIFT and STOP ❺ buttons at the same time to switch between standby on and standby off manually.

For more information about tape protection, see the setup menu items in the 500s on page 108.

❽ F FWD (fast forward) button
Press this button, lighting it, to fast forward the tape. By pressing the TRIM+/MARK button and this button simultaneously, you can cue up to any Mark IN point or cue point provided by ClipLink log data.

For details, see Chapter 6 "ClipLink Operation" on page 91.

❾ PLAY button
Press this button, lighting it, to start playback. Recording starts when you press this button together with the REC/SEQ button ❸, and manual editing starts when you press this button together with the EDIT button. If you press this button only during recording or manual editing, recording or manual editing stops and the unit returns to playback mode.

❿ Jog and shuttle dials
To search in shuttle mode, rotate the outer ring (shuttle dial). To search in jog mode, press the inner ring (jog dial) until it clicks and then rotate. Rotate in the clockwise direction to search in the forward direction (the FORWARD indicator lights), and rotate in the counterclockwise direction to search in the reverse direction (the REVERSE indicator lights).

For more information about search, see "Finding Edit Points — Search" on page 49.

⓫ SERVO indicator
Lights when the drum and capstan are servo-locked.

⓬ REW (rewind) button
Press this button, lighting it, to rewind the tape. Alternatively, by pressing the TRIM+/MARK button and this button simultaneously, you can cue up to any Mark IN point or cue point provided by ClipLink log data.

For details, see Chapter 6 "ClipLink Operation" on page 91.

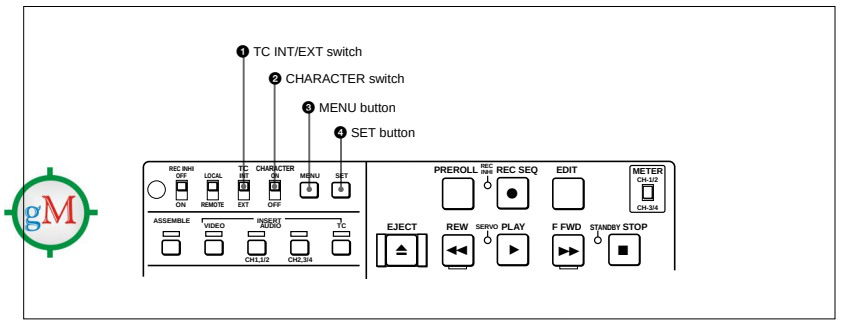
⓭ PLAYER/RECORDER buttons and indicators
When two DSR-70/70P units are combined and connected via the REMOTE (9-pin) connectors or DV connector (when DSBK-140 is installed), press to control one unit from another.
PLAYER button: The buttons of the editing and tape transport sections on the recorder side of the control panel work to control the player.
RECORDER button: The buttons of the editing and tape transport sections on the recorder side of the control panel work to control the recorder itself.

⓮ EJECT button
Press to eject the cassette or open the cassette compartment ⓰. The button lights while the cassette is being ejected.

⓯ REC INHI switch
When on, recording to the tape is inhibited, regardless of the setting of the cassette's REC/SAVE switch. (The REC INHI indicator ❷ lights.)

⓰ Cassette compartment
Insert a cassette here. Press the EJECT button ⓮ to open the compartment.

Timecode, character and setup menu section



❶ TC INT/EXT (internal/external timecode) switch
Selects the timecode to use.
INT: Use the timecode generated by this unit's built-in timecode generator.
EXT: The external timecode input to the TC IN connector.

❷ CHARACTER switch
Selects whether or not to display timecode and other superimposed text data on the LCD monitor and the output from the VIDEO OUTPUT 2 (SUPER) connector.

❸ MENU button
Use for setup menu operations. The setup menu appears on the LCD monitor when you press this button, and the original display appears when you press it again.

For more information about setup menu operations, see Chapter 7 "Setup Menu" on page 101.

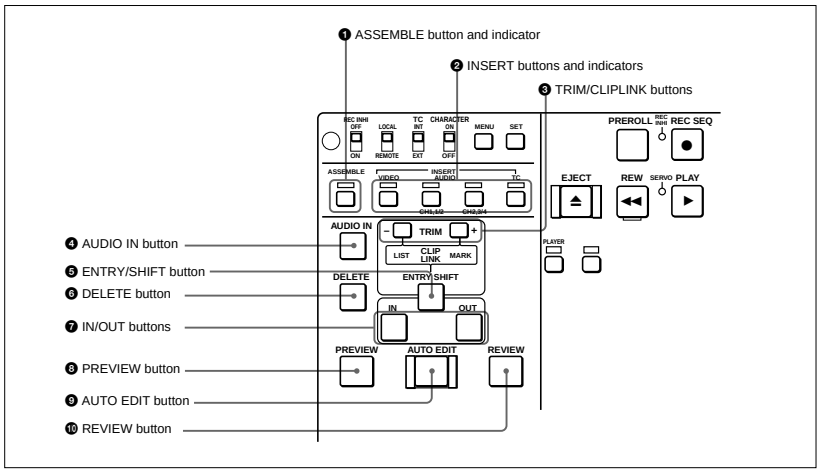
❹ SET button
Use to make setup menu settings, timecode settings, and user bit settings.

For more information about setup menu operations, see Chapter 7 "Setup Menu" on page 101. For more information about timecode and user bit settings, see "Setting Time Data" on page 61.

Location and Function of Parts

Editing section

Use two DSR-70/70P units or one DSR-70/70P unit and an editing player for editing.



❶ ASSEMBLE button and indicator
Press this button, lighting the indicator, to carry out assemble editing. Press the button again, turning the indicator off, to leave assemble edit mode.

❷ INSERT buttons and indicators
Press these buttons, turning the indicators on, to select signals for insert editing. Press the buttons again, turning the indicators off, to cancel the selection.

VIDEO button: Selects the video signal.

AUDIO CH1/CH-1,2 and CH2/CH-3,4 buttons:
When the AUDIO recording mode is 2 channel/48 kHz these select CH-1 (channel 1) or CH-2.
When the AUDIO recording mode is 4 channel/32 kHz, these select CH-1 and CH-2 (channels 1 and 2) or CH-3 and CH-4.
In this case it is not possible to select channels 1 to 4 individually.

TC button: Selects the timecode signal.

❸ TRIM/CLIPLINK buttons
Press the +/MARK or –/LIST buttons while pressing the IN/OUT buttons ❼ or AUDIO IN button ❹ to adjust edit points in unit of 1 frame. The +/MARK button advances 1 frame, and the –/LIST button returns 1 frame.
By pressing the TRIM+/MARK button and the F FWD or REW button simultaneously, you can cue up to any Mark IN point or cue point provided by ClipLink log data.

For details, see Chapter 6 "ClipLink Operation" on page 91.

During two-camera switched recording carried out using the optional DSBK-180/180P board, you can switch between the composite video signals from the two video cameras by pressing the +/MARK button and the –/LIST button at the same time.

For more information about two-camera switched recording, see the section "Two-Input Switched Video Recording" on page 82.

❹ AUDIO IN button
In insert editing, press this button together with the ENTRY/SHIFT button ❺ to set audio IN point separately from video IN point (audio split editing). After setting audio IN points, you can press this button alone to display them in the sub LCD.

❺ ENTRY/SHIFT button
Press together with the IN button, the OUT button, or the AUDIO IN button to set edit points. The buttons for the edit points that you set light.
Pressing this button together with a button with two functions, such as the REC/SEQ button, selects the function indicated in orange on the button.

❻ DELETE button
Press together with the IN/OUT buttons ❼ or the AUDIO IN button ❹ to delete edit points. The buttons go out or flash. A flashing button indicates that the edit point needs to be set again.

The DELETE button flashes to indicate contradictions that will prevent previews and automatic editing, for example when the durations are different on the player and recorder, or when the IN and OUT points are equal or reversed. In this case, set the edit points again.

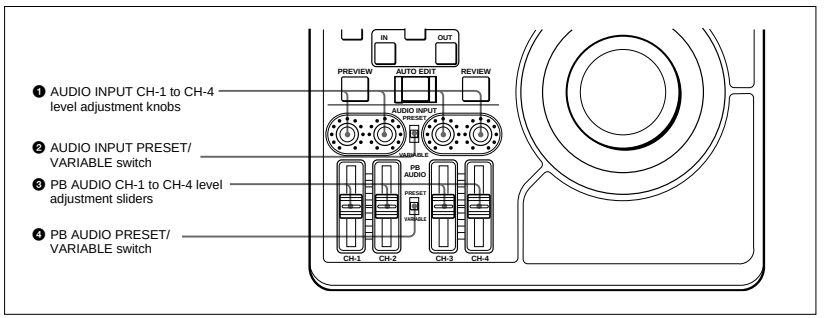
❼ IN/OUT (IN point/OUT point) buttons
Press these buttons, lighting them, together with the ENTRY/SHIFT button ❺ to set an IN point (edit start point) or OUT point (end point). After setting edit points, you can press either of these buttons alone to display the IN or OUT point in the sub LCD.

❽ PREVIEW button
Press this button, lighting it, when you want to preview editing results on the monitor after setting edit points but before executing an edit. If an IN point has not been set, the point where you press this button is used as the IN point in the preview. This button lights during the preview and goes out when the preview finishes.

❾ AUTO EDIT button
After setting edit points, press this button, lighting it to execute an automatic edit (record to the recorder). If an IN point has not been set, the point where you press this button is used as the IN point in the automatic edit. This button lights during execution and goes out when execution finishes.

❿ REVIEW button
After executing an automatic edit, press this button, lighting it to review the results of the edit.

Audio control section



❶ AUDIO INPUT CH-1 to CH-4 level adjustment knobs
Adjust the levels for each channel of analog audio signals input to the AUDIO INPUT CH-1/CH-2 connectors on the rear panel, or of the audio signals input to the SDI, SDTI(QSDI), and DV IN/OUT connectors of the optional boards.

❷ AUDIO INPUT PRESET/VARIABLE switch
Select the adjustment function for the levels of analog audio signals input to the AUDIO INPUT CH-1/CH-2 connectors on the rear panel, or of the audio signals input to the SDI, SDTI(QSDI), and DV IN/OUT connectors of the optional boards.

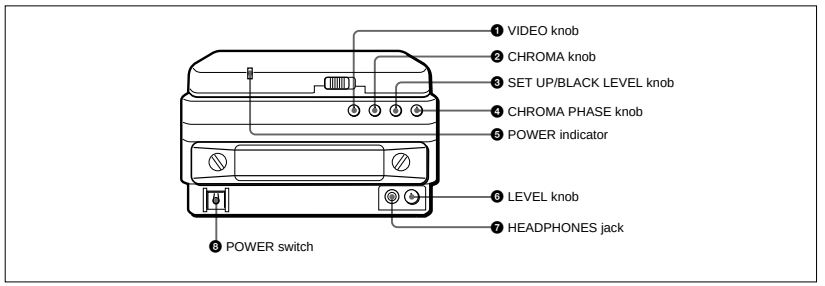
PRESET: Preset to fixed levels. Levels cannot be adjusted with the level adjustment knobs.
VARIABLE: Levels adjustable with level adjustment knobs. This allows you to adjust the levels while viewing the audio level meters in E-E mode.

For more information about switching to E-E mode, see the descriptions of the REC/SEQ and EDIT buttons (pages 17 and 18)

❸ PB AUDIO CH-1 to CH-4 level adjustment sliders
Make level adjustments by channel for playback audio channels 1 to 4.

❹ PB AUDIO PRESET/VARIABLE switch
Selects the level adjustment function for playback audio.
PRESET: Preset to fixed levels. Levels cannot be adjusted with the level adjustment sliders.
VARIABLE: Levels adjustable with the level adjustment sliders. This allows you to adjust the levels while viewing the audio level meter.

Front Control Section



❶ VIDEO knob
Adjusts the video signal output level. This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.
PRESET: This is the normal setting. Regardless of the knob position, the video signal output level is set to the standard value.
VARIABLE: The video signal output level can be adjusted across a range of ±3 dB.

You can change the adjustment range by using setup menu item 714. For details, see page 110.

❷ CHROMA knob
Adjusts the chroma signal output level. This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.
PRESET: This is the normal setting. Regardless of the knob position, the chroma signal output level is set to the standard value.
VARIABLE: The chroma signal output level can be adjusted across a range of ±3 dB.

You can change the adjustment range by using setup menu item 714. For details, see page 110.

❸ SET UP/BLACK LEVEL knob
Adjusts the setup level (for DSR-70) or the black level (for DSR-70P). This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.
PRESET: This is the normal setting. Regardless of the knob position, the setup level (for DSR-70) or the black level (for DSR-70P) is set to the standard value.
VARIABLE: The setup level can be adjusted across a range of ±30 IRE (for DSR-70) and the black level can be adjusted across a range of ±210 mV (for DSR-70P).

❹ CHROMA PHASE knob
Adjusts the chroma phase (phase relative to burst). This knob is a push switch. When you press it to bring it into the raised position, the setting becomes VARIABLE. When you press it again to depress it, the setting returns to PRESET.
PRESET: This is the normal setting. Regardless of the knob position, the chroma phase is set to the standard value.
VARIABLE: The chroma phase can be adjusted across a range of ±30˚.

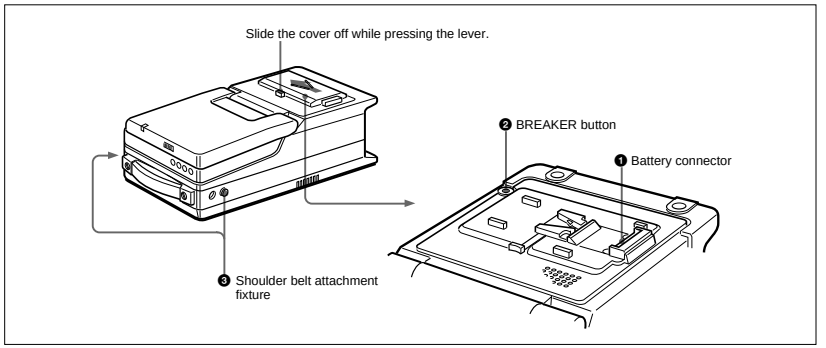
❺ POWER indicator
Lights green when the POWER switch ❽ is turned on, and changes to red when recording starts.

❻ LEVEL (speaker/headphones level) knob
Adjusts the volume of the speaker or headphones connected to the HEADPHONES jack ❼.

❼ HEADPHONES jack (stereo phone jack)
Connect headphones. The speaker is muted when headphones are connected.

❽ POWER switch
Powers the unit on and off. When the unit is powered, the POWER indicator ❺ lights.

Top Panel



❶ Battery connector
Connect a BP-L60/L60A//L90/L90A Battery Pack, DC-L90 Battery Adaptor, or AC-DN2/DN2A AC Adaptor.
When the AC-550/550CE AC Adaptor or another power supply has been connected to the DC IN connector on the rear panel, the power from the DC IN connector is used instead of the power from this connector.

For more information, see "Power Preparations" on page 29.

Note
The AC-DN1 AC Adaptor and the BP-L40 and NP-1B Battery Packs cannot be used.

Location and Function of Parts

❷ BREAKER button
When excess power flows inside the unit, the breaker activates to protect the circuits by automatically shutting down the power. After inspecting and adjusting the unit, press this button. If there is no further trouble, the power will be restored.

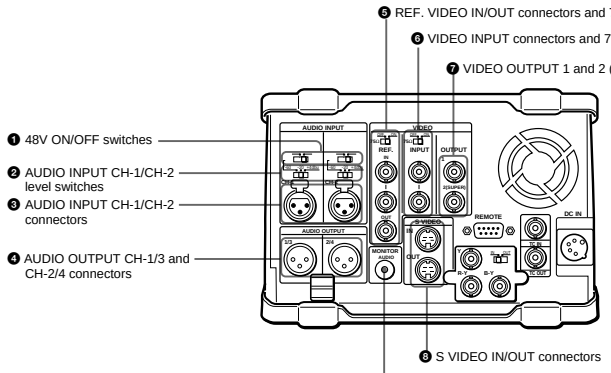
For inspection and adjustment of the unit, consult your Sony dealer.

❸ Shoulder belt attachment fixture
Attach the supplied shoulder belt.

For more information, see "Using the Shoulder Belt" page 126.

Rear Panel

Analog audio/video input and output section


❺ REF. VIDEO IN/OUT connectors and 75Ω termination switch
❻ VIDEO INPUT connectors and 75Ω termination switch
❼ VIDEO OUTPUT 1 and 2 (SUPER) connectors
❶ 48V ON/OFF switches
❷ AUDIO INPUT CH-1/CH-2 level switches
❸ AUDIO INPUT CH-1/CH-2 connectors
❹ AUDIO OUTPUT CH-1/3 and CH-2/4 connectors
❽ S VIDEO IN/OUT connectors
❾ MONITOR AUDIO connector
AUDIO INPUT
AUDIO OUTPUT
VIDEO
REMOTE
DC IN

This illustration shows the DSR-70/70P fitted with the optional DSBK-170.

❶ 48V ON/OFF switches
When the AUDIO INPUT CH-1/CH-2 level switches are set to –60 dBu, setting these switches to ON causes 48-V power to be supplied to the AUDIO INPUT connectors.

❷ AUDIO INPUT CH-1/CH-2 level switches
Select the input level of the analog audio signals of input channels 1 and 2.

–60 dBu: Microphone input
0 dBu: Line audio input
+4 dBu: Line audio input (0 dBu = 0.775 Vrms)

For microphone inputs, use 48-V microphones, and set the AUDIO INPUT CH-1/CH-2 level switches 2 to –60 dBu and the 48V ON/OFF switches 1 to ON, respectively.

Caution
Using a microphone other than a 48-V microphone may damage the microphone.

❸ AUDIO INPUT CH-1/CH-2 connectors (XLR 3-pin, female)
Input the analog audio signals of input channels 1 and 2.

❹ AUDIO OUTPUT CH-1/3 and CH-2/4 connectors (XLR 3-pin, male)
Output the audio signals of the channels selected with the LINE OUT in the sub LCD menu. You can select two combinations of output signals: channels 1 and 2, or channels 3 and 4.

For more information about LINE OUT settings, see page 71.

Note
The level can be adjusted from the control panel, but mixed signals cannot be output.

❺ REF. VIDEO IN/OUT (reference video signal input/output) connectors (BNC type) and 75Ω termination switch
When using an external reference video signal, input it to one of the REF. VIDEO IN connectors. Set the 75Ω termination switch to OFF when the signal is bridged, and to ON when the signal is not bridged.
The REF. VIDEO OUT connector outputs a reference video signal.

❻ VIDEO INPUT (analog composite video input) connectors (BNC type) and 75Ω termination switch
Input an analog composite video signal. Set the 75Ω termination switch to OFF when the signal is bridged, and to ON when the signal is not bridged.

❼ VIDEO OUTPUT (analog composite video output) 1 and 2 (SUPER) connectors (BNC type)
Output analog composite video signals. When the CHARACTER switch is set to ON, timecode, menu settings, error messages and other information is superimposed on the output of 2 (SUPER) connector.

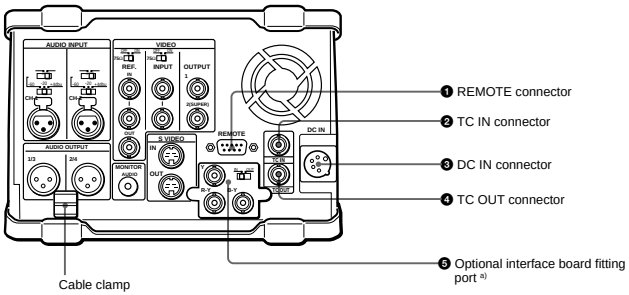
For details about the superimposed information, see page 61.

❽ S VIDEO IN/OUT connectors (4-pin)
Input an S-video signal with separated Y (luminance) and C (chroma: 3.58 MHz for DSR-70 and 4.43 MHz for DSR-70P) components to the S VIDEO IN connector.
The S VIDEO OUT connector outputs an S-video signal.

❾ MONITOR AUDIO connector (phono jack)
Output the audio signals of the channels selected with the MONITOR in the sub LCD menu. The level is adjustable, and mixing is possible.

For more information about the MONITOR item, see page 71.

Optional board/timecode/remote control/power input and output section


❶ REMOTE connector
❷ TC IN connector
❸ DC IN connector
❹ TC OUT connector
❺ Optional interface board fitting port a)
Cable clamp

a) This illustration shows the DSR-70/70P fitted with the optional DSBK-170.

❶ REMOTE (9-pin remote control) connector (D-sub 9-pin)
When editing with two DSR-70/70P units, connect this connector on each unit using a 9-pin remote control cable (not supplied). When editing with this unit and external equipment, connect the external equipment.

❷ TC IN (timecode input) connector (BNC type)
To record timecode from an external device, input the timecode from the external device's timecode output connector.

❸ DC IN (external power input) connector (XLR 4-pin, male)
To power this unit with AC power, connect to the DC output connector of the AC-550/550CE AC adaptor. You can also connect a BP-90/90A Battery Pack using the DC-210 Battery Adaptor.
Power supplied through this connector is used on a priority basis even when you have connected a battery pack or AC-DN2/DN2A AC Adaptor to the battery connector on the top panel.

For more information, see "Power Preparations" on page 29.

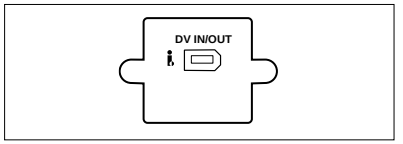
❹ TC OUT (timecode output) connector (BNC type)
Outputs the following types of timecode, depending on the VCR operating status.
During playback: The playback timecode
During recording: The timecode generated by the internal timecode generator, or the timecode input through the TC IN connector.

For details of the timecode output during recording, see setup menu item 611 (page 109).

❺ Optional interface board fitting port
Install any one of the following optional interface boards here:
• DSBK-140 i.LINK/DV Input/Output Board
• DSBK-150 SDTI (QSDI) Input/Output Board
• DSBK-160 SDI Input/Output Board
• DSBK-170 Analog Component Input/Output Board

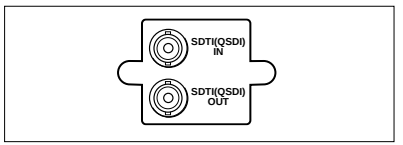
The connectors provided by the optional boards are as follows.

Connector of the DSBK-140



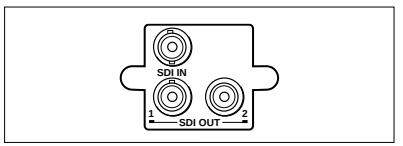
DV IN/OUT (DV input/output) connector (6-pin IEEE1394 connector): This connector is i.LINK compatible. Connect to another DSR-70/70P unit or a consumer DV camera to carry out such operations as recording and editing.

Connectors of the DSBK-150



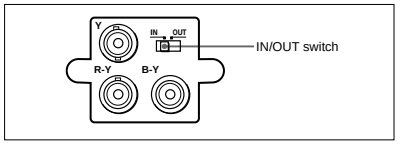
SDTI(QSDI) IN/OUT (input/output) connectors (BNC type): Use to input/output digital video/audio signals in SDTI(QSDI) format.

Connectors of the DSBK-160



SDI IN/OUT 1, 2 (serial digital interface signal input, output 1, 2) connectors (BNC type): Use to input/output digital video/audio signals in SDI (D1) format.

Connectors of the DSBK-170



Y, R–Y, B–Y (luminance and color difference signal) input/output connectors (BNC type): Use to input or output analog component signals (Y, R–Y, B–Y). When using as input connectors, set the IN/OUT switch to IN. When using as output connectors, set the IN/OUT switch to OUT.

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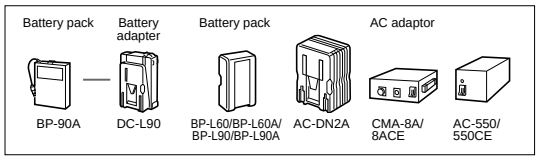
Chapter 2

Power Preparations and Connections

Power Preparations

This unit can be powered by batteries or AC power.
Example battery packs and AC adaptors that can be used are shown below.



Note

If you attach or remove batteries or AC adaptors incorrectly, they may fall down and cause body injury.
Follow the procedures described below to attach or remove them.

Usable Batteries

Batteries that can be used with this unit are as follows. For each type of battery, a special battery adaptor and battery charger is required.

Battery	Battery Adaptor	Battery Charger
BP-90/90A (mounted on this unit)	DC-L90	BC-210/210CE/ 410/410CE
BP-90/90A (connected to DC IN connector)	DC-210	BC-210/210CE/ 410/410CE
BP-L60/L60A/L90/L90A	Not needed	BC-L100/L100CE/ L50

In the subsequent pages, the batteries such as the BP-90/90A and BP-L60/ L60A will also be referred to as the BP-90(A) and BP-L60(A).

Notes about battery usage

- Before using the batteries, be sure to charge them fully with the special battery charger. Refer to the operating instructions of your battery charger for more information about how to charge the batteries.
- Batteries may not be completely charged if you charge them immediately after use when they are still warm. You should wait until the batteries cool before charging them.

Using the BP-L60(A)/L90(A) Battery Pack

This unit can be operated for about 120 minutes at normal temperature on fully charged BP-L90 Battery Pack. (When no optional board is installed.)

To charge the battery pack

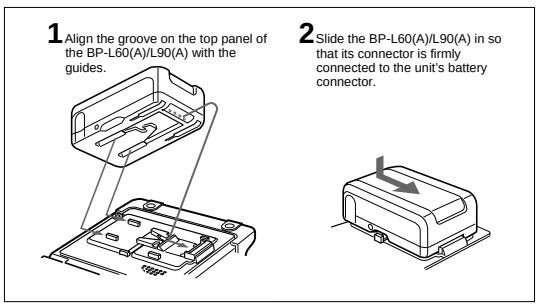
Before use, charge the battery pack with the BC-L100/L100CE Battery Charger. It takes about 2.5 hours to charge the BP-L60(A) and about 3.5 hours to charge the BP-L90(A).

For more information about how to charge the battery pack, refer to the manual for the BC-L100/L100CE.

To attach the battery pack

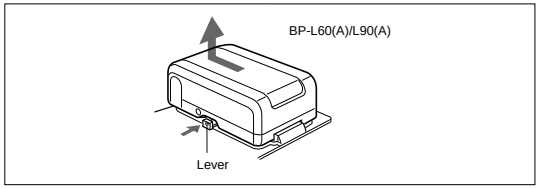
Attach the BP-L60(A)/L90(A) as shown in the following figure. Before attaching, remove the cover of the battery connector.

Remove the cover in the same way that you remove the battery pack. For details see the next section "To remove the battery pack".


1 Align the groove on the top panel of the BP-L60(A)/L90(A) with the guides.
2 Slide the BP-L60(A)/L90(A) in so that its connector is firmly connected to the unit's battery connector.

To remove the battery pack

With the lever pushed in, slide the BP-L60(A)/L90(A) out.



Using the BP-90(A) Battery Pack

Different battery adaptors are used when mounting the BP-90(A) on the top panel of this unit and when connecting it the DC IN connector.
This unit can be operated for about 70 minutes at normal temperature on a fully charged BP-90(A) Battery Pack. (When no optional board is installed.)

To charge the battery pack

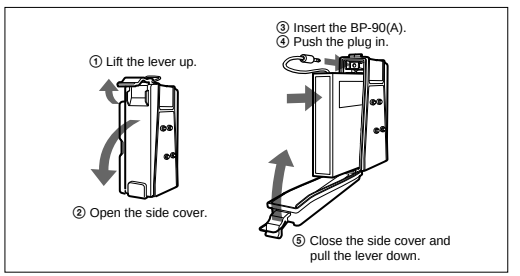
Before use, be sure to charge the battery pack with the BC-210/210CE/410/410CE Battery Charger. It takes about 2 hours to charge the BP-90(A).

For more information about how to charge the battery pack, refer to the manual for the BC-210/210CE/410/410CE.

To attach to the top panel of this unit

Use the DC-L90 Battery Adaptor.

1 Mount the BP-90(A) in the DC-L90.



(Continued)

Power Preparations

2 Attach the DC-L90 to the top panel of this unit.

Use the same method that you use to attach the BP-L60(A)/L90(A). For details, see "To attach the battery pack" on page 30.

To connect to the DC IN connector

Use the DC-210 Battery Adaptor.

For more information about connections, refer to the operating instructions of the DC-210.

You can also connect another battery pack to the DC IN connector when a BP-90(A) battery pack is already mounted on the top panel of this unit. When you connect an external battery pack to the DC IN connector, the power supply automatically switches to the external battery pack from an internal battery pack mounted on the top panel of the unit.

Notes

- Noise may occur in video and audio signals at the moment when the unit switches from the internal to the external battery.
- It is always the external battery connected to the DC IN connector that serves as power supply. You cannot switch the power supply from the external battery to the internal battery while the external battery is connected to the DC IN connector.

When an external battery pack is almost exhausted

If an internal battery pack is already mounted, disconnect the external battery pack by pulling its DC power cord out from the DC IN connector. If no internal battery back is mounted, disconnect the external battery pack after mounting a fully charged internal battery pack.

When an internal battery pack is almost exhausted

For the remaining battery power indication *(see page 66)*, the "BATT" display flashes.
Connect a fully charged external battery pack to the DC IN connector, then exchange the internal battery pack.

Using AC Power

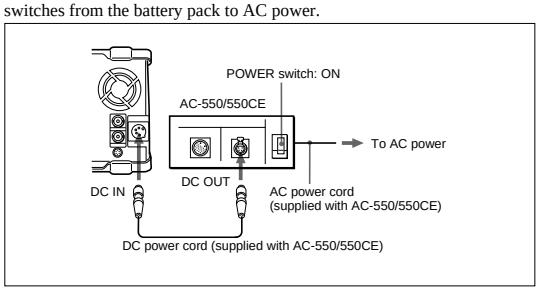
You can operate the unit from an AC power source by using the AC-550/550CE AC Adaptor or AC-DN2/DN2A (subsequently also refered to as the AC-DN2(A)) AC Adaptor.
Use the AC-550/550CE to connect the AC power source to the DC IN connector, and the AC-DN2(A) to connect the AC power source to the battery connector.

To use the AC-550/550CE

As shown in the following figure, connect the AC-550/550CE to the AC power source and turn it on.
When you connect AC power, the power supply automatically switches to the AC power from a battery pack mounted on the top panel of the unit.

Note

Noise may occur in video and audio signals at the moment when the unit switches from the battery pack to AC power.



To use the AC-DN2(A)

Follow the procedure below to mount the AC-DN2(A) on the top panel of this unit, and connect to AC power.
When two DSR-70/70P units are combined, you can supply both units with power by fitting a single AC-DN2A to either unit.

Caution

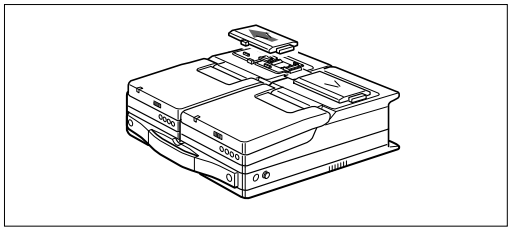
When you use a single AC-DN2A to supply power to two DSR-70/70P units, exercise the following caution:

- Do not turn the POWER switches of both units on at a time. (Turn one unit on, then wait a moment before turning the other unit on.)
- Do not insert cassettes into both units at a time. (Insert a cassette into one unit, then wait a moment before inserting a cassette into the other unit.)

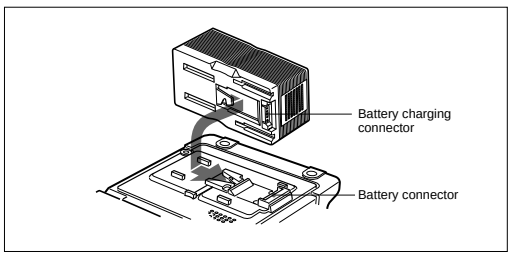
If you turn on the POWER switches of the recorder and player at a time or insert cassettes to the recorder and player at a time, this unit possibly may not be powered. In this case, turn the POWER switches of both units off, then turn them on again following the above instructions. Should this unit not be powered, turn both POWER switches off and disconnect the AC power cord of the AC-DN2A. After about 10 minutes, connect the AC power cord of the AC-DN2A again and turn the two units' POWER switches on one by one as mentioned above.

Power Preparations

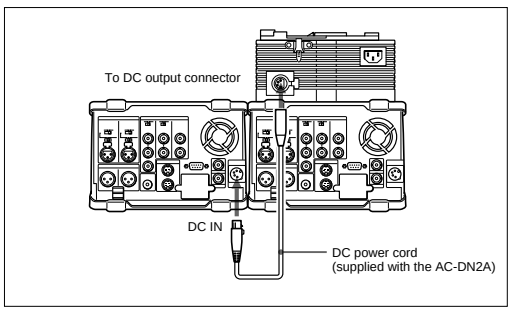
1 Remove the cover of the battery connector.



2 Insert the V-wedge shoe on the AC-DN2A in the V-groove on one unit and slide the AC-DN2A until the battery charging connector is connected to the battery connector.



3 Use the DC power cord (supplied with the AC-DN2A) to connect the DC output connector on the AC-DN2A and the DC IN connector on the rear of another unit.

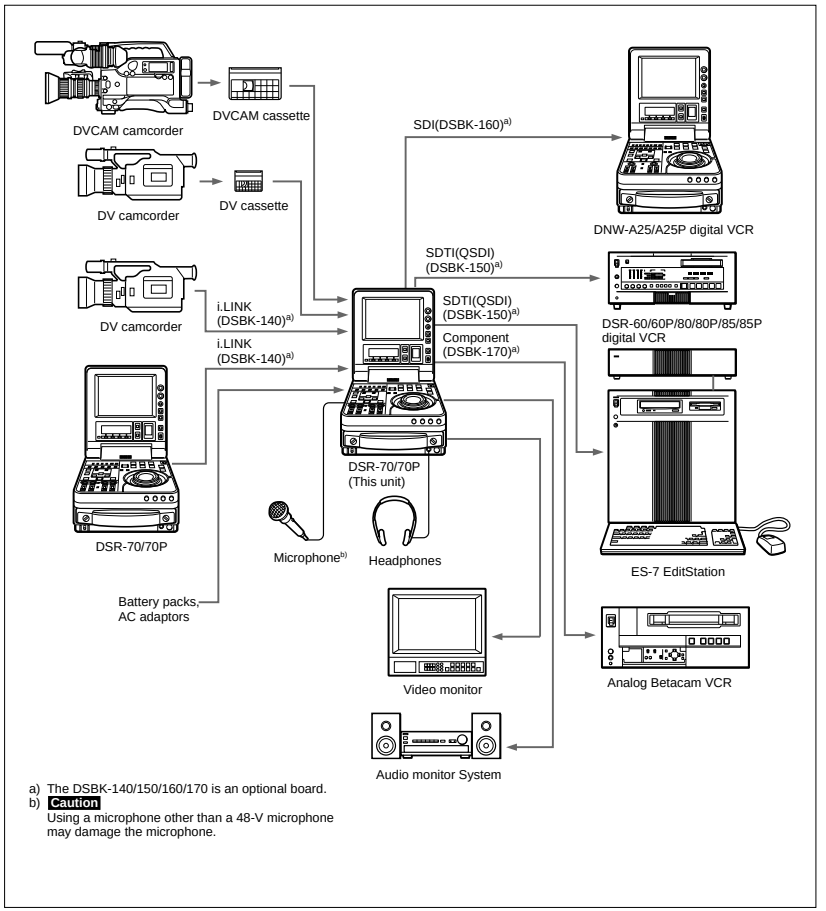


4 Supply the AC-DN2A with AC power.

For information about how to supply AC power to the AC-DN2A, refer to the manual for the AC-DN2A.

System Configuration

The figure below shows example equipment that can be connected to this unit.



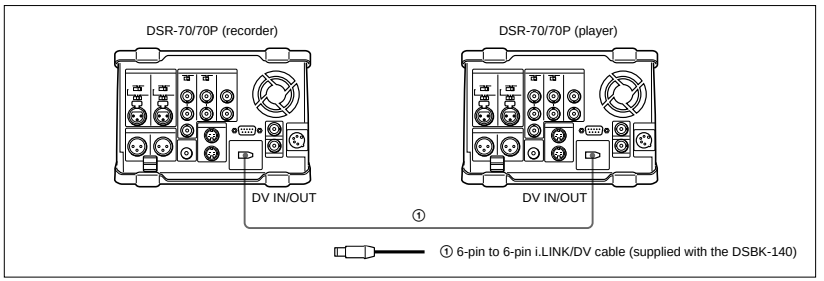
a) The DSBK-140/150/160/170 is an optional board.
b) **Caution**
Using a microphone other than a 48-V microphone may damage the microphone.

Connections for Cut Editing Using Two DSR-70/70P Units — i.LINK Connections (Optional DSBK-140 Required)

For a cut editing system using two DSR-70/70P units with an i.LINK interface, the following figure shows an example of the connections.
Use the same configuration when dubbing signals in DVCAM format via an i LINK interface.

Note

In this case, both of the recorder and player require the DSBK-140 i.LINK/DV Input/Output Board.



DSR-70/70P (recorder and player) settings

Switch/menu	Recorder	Player
REMOTE/LOCAL	LOCAL	REMOTE
Sub LCD menu general setting item REMOTE	i.LINK	i.LINK
Sub LCD menu home page input video/audio signal indication	i.LINK	Other than i.LINK

It is possible to combine two DSR-70/70P units using the optional BKNW-225 Docking Kit (see page 125).
Also, for ease of carriage of the unit, you can use a shoulder belt (see page 126).

For more example editing system connections, see Chapter 8"Connections and Settings" (page 113).

Chapter 3

Editing

Sequence of Editing Operations

The following is a typical sequence of cut editing operations carried out using two DSR-70/70P units as a pair of player and recorder.

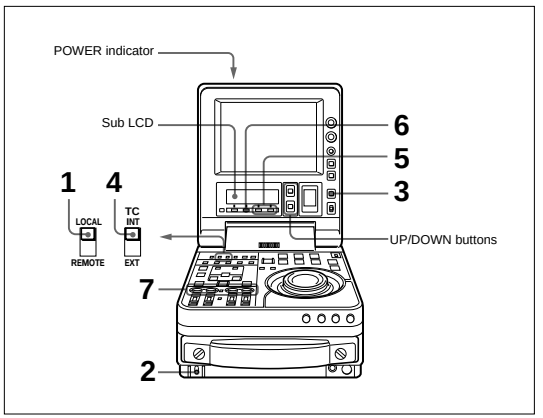
Sequence of Operations	See
Making necessary settings	*"Settings for Editing" (page 38)*
⇩	
Insert cassettes. **• Insert a cassette for recording the results of editing in the recorder.** **• Insert the cassette on which material to be edited has been recorded in the player.**	*"DVCAM cassettes" (page 43)*
⇩	
Select an edit mode.	*"Selecting an Edit Mode" (page 47)*
⇩	
Determine edit points. **• Preview edit results.** **• Modify edit points, if necessary.**	• *"Finding Edit Points —Search" (page 49)* • *"Setting Edit Points" (page 50)*
⇩	
Execute an edit. **• Review the edit results.** **• Redo the edit, if necessary.**	*"Executing an Edit" (page 57)*

Settings for Editing

When using two units of the DSR-70/70P as a pair of recorder and player in an editing system, set the recorder and player as follows. Basically, the same recorder settings and player settings apply when you use a DSR 70/70P unit as a stand-alone recorder or player.

Recorder Settings

Make settings as follows.



1 Set the REMOTE/LOCAL switch to LOCAL.

2 Set the POWER switch to ON, then make the following checks.

When the unit is powered, the POWER indicator lights and the sub LCD home page appears in the sub LCD.

Check	Indication/What to do	*See for details*
Enough battery power remaining?	Check the remaining battery power indication. **If "BATT" is flashing** Replace the battery.	*"❺Remaining battery power indication" (page 67)*
No condensation in the unit?	**If "HUMID!" is displayed** Leaving the unit powered, wait until the message disappears. (In this case, the alarm message "MOISTURE HAS BEEN DETECTED" also appears on the LCD monitor.)	*"Condensation" (page 127)*

3 Use the COUNTER SELECT button to select the type of time data to be used.

Each press of the button cycles through three options in the sub LCD: CNT, TC, and UB.

Selectable time data	Time data indication in the sub LCD
Count in the counter	CNT
Timecode	TC
User bit data	UB

4 When the time data selected in step **3** is timecode (TC), use the TC INT/EXT switch to select the type of timecode.

Selectable timecode	TC INT/EXT switch setting
Timecode generated by the internal timecode generator	INT
External timecode input to the TC IN connector	EXT

5 Select the formats of video and audio input signals to be used.

If any signal not connected to the unit is selected, the corresponding signal indication in the sub LCD flashes.

To select an input video signal format

Press the sub LCD operation button F4, highlighting the input video signal indication, then press the UP button or the DOWN button repeatedly until the input video signal indication corresponding to the desired video signal appears in the sub LCD.

Selectable video signals (Input connectors)	Input video signal indication in the sub LCD
Composite signals (VIDEO INPUT)	CMPST
S-video signal (S VIDEO IN)	S VIDEO
i.LINK (DV) signals (DV IN/OUT (optional DSBK-140))	i.LINK
SDTI (QSDI) signals (SDTI(QSDI) IN (optional DSBK-150))	SDTI
SDI signals (SDI IN (optional DSBK-160))	SDI
Component signals (Y, R–Y, B–Y (optional DSBK-170))	CMPNT[a)]

a) When using the component signals (CMPNT), set the IN/OUT switch of the DSBK-170 to IN.

Selecting the i.LINK (DV) or SDTI (QSDI) signals for input video causes the same to be automatically selected also for input audio.

(Continued)

To select an input audio signal format

Press the sub LCD operation button F3, highlighting the input audio signal indication, then press the UP button or the DOWN button repeatedly until the input audio signal indication corresponding to the desired audio signal appears in the sub LCD.

Selectable audio signals (Input connectors)	Input audio signal indication in the sub LCD
Analog signals (AUDIO INPUT CH-1/CH-2)	ANALOG
i.LINK (DV) signals (DV IN/OUT (optional DSBK-140))	i.LINK
SDTI (QSDI) signals (SDTI(QSDI) IN (optional DSBK-150))	SDTI
SDI signals (SDI IN (optional DSBK-160))	SDI

Selecting the i.LINK (DV) or SDTI (QSDI) signals for input audio causes the same to be automatically selected also for input video.

Cut editing using i.LINK

When using a cut editing system as illustrated in the section "Connections for Cut Editing Using Two DSR-70/70P Units — i.LINK connections" on page 36, select "i.LINK" for input video and audio.

6 Select the audio recording mode.

Press the sub LCD operation button F2, highlighting the audio recording mode indication, then press the UP button or the DOWN button so that the audio recording mode indication corresponding to the selected mode appears in the sub LCD.

Selectable audio recording mode	Indication in the sub LCD
Two-channel, 48-kHz recording mode	2/48k
Four-channel, 32-kHz recording mode	4/32k

Notes

- In the DVCAM format, there are two audio recording modes, that is, two channel, 48-kHz mode and four-channel, 32-kHz mode. It is not possible to select other modes (for example, four-channel, 48-kHz mode).
- If an audio signal in a different mode than the base tape is used in assemble or insert editing, the signals will be discontinuous at the edit points and correct editing will not be obtained. For this reason, audio editing between different modes is inhibited on this unit.
  For smooth editing operations, check the audio recording mode of the base tape beforehand. If on a tape there is a point where the audio mode is switched, you cannot perform an insert editing on that point.
- Once you have started recording, you cannot change the audio mode selection.

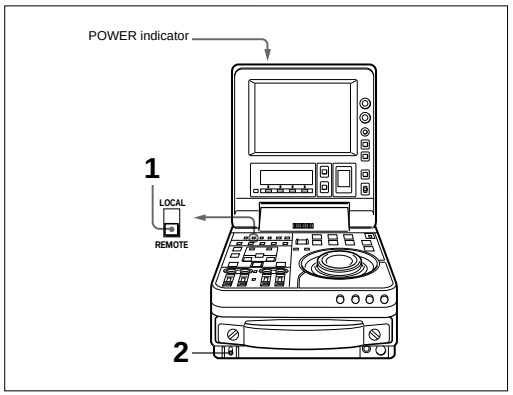
7 Use the AUDIO INPUT PRESET/VARIABLE switch and the AUDIO INPUT CH 1 to CH-4 level adjustment knobs to adjust the audio input levels.

Watching the audio level meter, adjust the levels so that the meter does not indicate higher values than 0 dB when the audio signals are at their maximum.

AUDIO INPUT PRESET/ VARIABLE switch setting	Audio input level adjustment
PRESET	Preset to fixed levels. Levels cannot be adjusted with the level adjustment knobs.
VARIABLE	Levels adjustable with the level adjustment knobs. Adjust the levels while viewing the audio level meter in E-E mode.

Player Settings

Make settings as follows.



1 Set the REMOTE/LOCAL switch to REMOTE.

(Continued)

2 Set the POWER switch to ON, then make the following checks.

When the unit is powered, the POWER indicator lights and the sub LCD home page appears in the sub LCD.

Check	Indication/What to do	*See for details*
Enough battery power remaining?	Check the remaining battery power indication. **If "BATT" is flashing** Replace the battery.	*" ❺Remaining battery power indication" (page 67)*
No condensation in the unit?	**If "HUMID!" is displayed** Leaving the unit powered, wait until the message disappears. (In this case, the alarm message "MOISTURE HAS BEEN DETECTED" also appears on the LCD monitor.)	*"Condensation" (page 127)*

Handling Cassettes

This unit can use standard-size and mini-size DVCAM cassettes listed below.

Model name	Size
PDV-64ME/94ME/124ME/184ME	Standard size
PDVM-12ME/22ME/32ME/40ME	Mini size

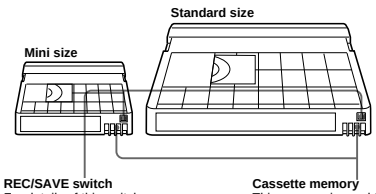
The numbers in each model name indicate the maximum recording/playback time (in minutes) for each model. For example, the PDV-184ME has a maximum recording/playback time of 184 minutes.

Notes

- If you insert an incorrect type of cassette, it will be automatically ejected.
- When operating this unit as a player, you can also use DV cassettes on the unit. However, it is the best choice to always use DVCAM cassettes because they are more reliable than DV cassettes whatever your purpose may be: playback, editing, or long-period storage of recordings.
- Cassettes that have been recorded by a DV-format recorder can be played back on this unit, but you cannot use them to carry out recording by editing. If you insert such a cassette into this unit, the NO EDIT indication lights up in the sub LCD menu home page.

DVCAM cassettes

The following figure illustrates the DVCAM cassette's appearance.



REC/SAVE switch
For details of this switch, see "Preventing accidental erasure" (page 44).

Cassette memory
This memory is used to store ClipLink log data. For details of ClipLink log data, refer to "ClipLink™ Guide" supplied with this unit.

Handling Casettes

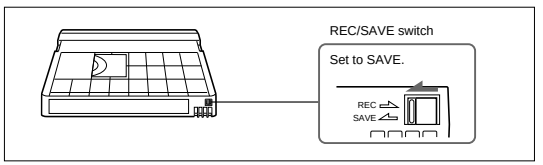
Notes on using cassettes

- Before storing the cassette, rewind the tape to the beginning and be sure to put the cassette in its storage case, preferably on end instead of flat on its side. The storage case of a DVCAM cassette is specially designed to ensure a long-period storage of the tape.
  Storing a cassette in any other condition (not rewound, out of its case, etc.) may cause the video and audio contents to become damaged over time.
- If the cassette memory connector (contact point) becomes dirty, connection problems may occur and cause a loss of functions. Remove away any dust or dirt from this area before using the cassette.
- If the cassette is dropped on the floor or otherwise receives a hard impact, the tape may become slackened and may not record and/or play back correctly.

For instructions on removing tape slack, see below.

Preventing accidental erasure

Set the REC/SAVE switch on the cassette to SAVE to prevent accidental erasure of recorded contents.

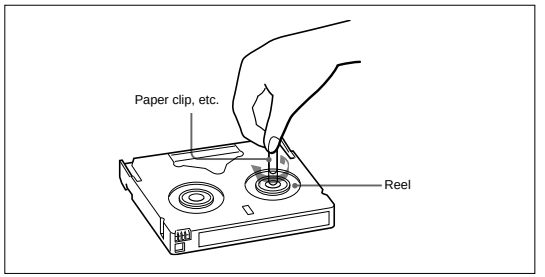


To enable re-recording

Set the cassette's REC/SAVE switch to REC.
If you insert a cassette into the unit when this switch is set to SAVE, the unit will not record when you press the PLAY button while holding down the REC/SEQ button.

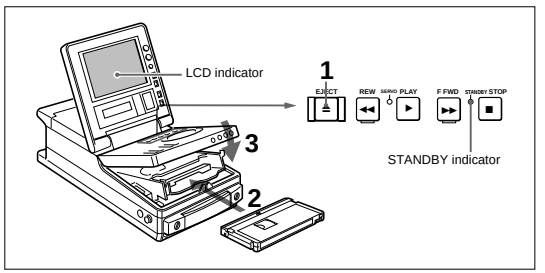
Checking the tape for slack

Using a paper clip or a similar object, turn the reel gently in the direction shown by the arrow. If the reel does not move, there is no slack. Insert the cassette into the cassette compartment, and after about 10 seconds take it out.



Loading/Ejecting Cassettes

To load a cassette



1 With the unit powered on, press the EJECT button.

The control panel lifts up and the cassette compartment opens.

2 Load a cassette in the direction shown in the figure.

The message "CASSETTE OUT" displayed on the LCD monitor changes to "TAPE UNTHREAD".

Note

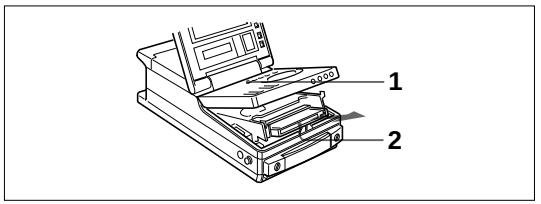
If the message on the LCD monitor does not change to "TAPE UNTHREAD", redo the cassette insertion procedure.

3 Close the control panel. (You should hear a click.)

The STANDBY indicator lights.

Handling Casettes

To eject the cassette



1 With the unit powered on, press the EJECT button.

The control panel lifts up and the cassette compartment opens.

2 Remove the cassette and close the control panel.

Notes

- Do not shut the display panel while the control panel is still open. Doing so may damage the lock mechanism of the display panel.
- The EJECT cannot be used to eject a cassette when battery power falls to below about 9 V. Connect an external power supply.

For information about the remaining battery power, see the section "❺ Remaining battery power display" on page 67.

Selecting an Edit Mode

When you use two DSR-70/70P units, you can do two types of editing: assemble editing and insert editing. This section provides an outline of each type and explains how to select an edit mode.

In the subsequent explanation of editing operations in this chapter, illustrations of a pair of DSR-70/70P units (player and recorder) combined using the optional BKNW-225 Docking Kit are used *(see page 125)*. In each illustration, as viewed from the front, the unit on the left is the player and the unit on the right is the recorder.

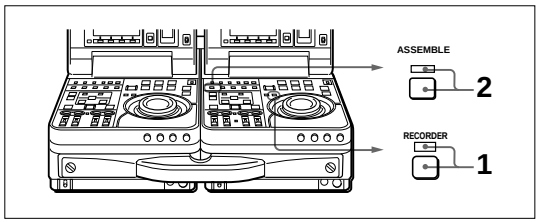
Assemble Editing

In assemble editing, you record video and audio materials in order from the start of the tape. In addition to video and audio, timecode is also recorded. If timecode is already recorded on the tape, the new timecode is recorded so as to form a continuous sequence with the existing timecode. Assemble editing is convenient when you are recording on a new tape.

Note

Before you begin assemble editing for the first time with a new tape, video signal such as black signal and timecode must be recorded on the tape in advance of the recorder IN point for a length equal to or greater than the preroll time.

Selecting assemble mode



1 Press the RECORDER button on the recorder control panel.

The RECORDER indicator lights.

2 Press the ASSEMBLE button on the recorder control panel.

The ASSEMBLE indicator lights.

To cancel assemble mode
Press the ASSEMBLE button again to turn the ASSEMBLE indicator off.

http://getMANUAL.com

Selecting an Edit Mode

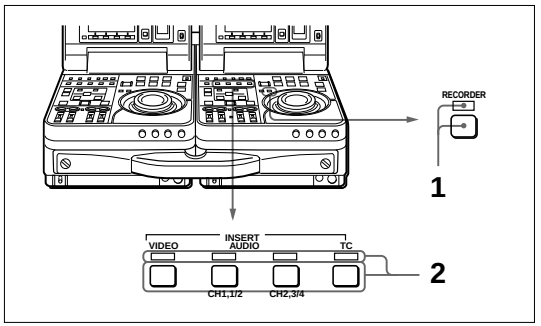
Insert Editing

In insert editing, you insert video, audio, and timecode at desired positions on an already recorded tape. You can insert all three types of data at the same time, or insert one of the types separately.

Note

Before you use an unrecorded tape in insert editing, video signal such as black signal and timecode must be recorded on all over the tape.

Selecting insert mode



1 Press the RECORDER button on the recorder control panel.

The RECORDER indicator lights.

2 Press one or more of the INSERT buttons on the recorder control panel to select the signals you want to insert.

The corresponding INSERT indicators light.

To cancel insert mode

Press the lit INSERT buttons again to turn the corresponding indicators off. Selection of a signal is canceled when its indicator goes out.

Finding Edit Points —Search

Playback in search mode using the jog and shuttle dials allows finding edit points quickly.

Jog mode

Playback speed is determined by the rotation speed of the jog dial between ±1 times normal speed. Rotate the dial in the clockwise direction to search in the forward direction, and rotate the dial in the counterclockwise direction to search in the reverse direction.

Shuttle mode

Playback speed is determined by the rotation angle of the shuttle dial between ±32 times normal speed (21 steps). Click points allow playback at ±5 times normal speed.
Rotate the dial in the clockwise direction to search in the forward direction, and rotate the dial in the counterclockwise direction to search in the reverse direction.

Switching between each mode

Lighting the JOG or SHUTTLE indicator shows the corresponding mode is selected.

Switching from jog to shuttle mode

Rotate the shuttle dial.

Switching from shuttle to jog mode

Press the jog dial or rotate the jog dial while setting the shuttle dial at still position.

To switch between normal playback and search modes

Press the PLAY and search buttons alternately.

As factory default setting, rotating the jog or shuttle dial switches to search mode at any time except during recording and editing.
If you change the setting of setup menu item 101, the above function will be disabled and switching to search mode will be possible only when the search button is pressed.

For details about setting, see item 101 on page 106.

Setting Edit Points

In editing operations, there are four edit points: an IN point and an OUT point on the recorder side, and an IN point and an OUT point on the player side. As soon as you set three of the edit points, the fourth edit point is calculated automatically.
In insert editing, you can set IN points for audio separately from the IN points for video (audio split editing).

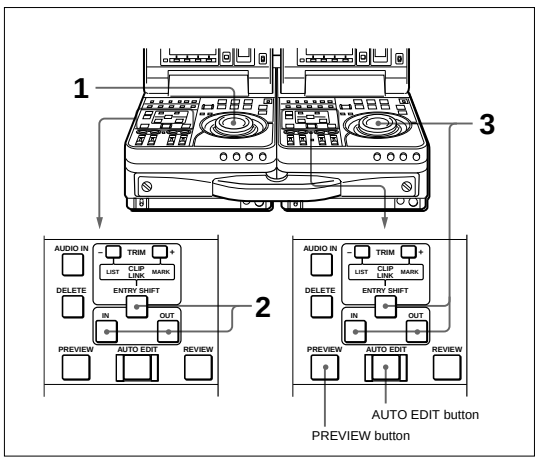
For details, see "To set audio IN points separately from video IN points (audio split editing)" on page 51.

Note

If it is necessary to operate the buttons or dial on the player, set setup menu item 006 "LOCAL FUNCTION ENABLE" to ENA beforehand *(see page 102).*

Setting Edit Points

Proceed as follows to set edit points.



1 Rotate the player side jog or shuttle dial to find the player edit points.

For details about jog/shuttle dial operations, see "Finding Edit Points — Search" on page 49.

2 Press the IN button together with the ENTRY/SHIFT button at the point you want to set as the IN point. Press the OUT button together with the ENTRY/SHIFT button at the point you want to set as the OUT point.

The IN and OUT points are set, and the IN and OUT buttons light.

3 Repeat steps **1** and **2** on the recorder side to set the recorder IN or OUT point.

As soon as you set three edit points on the player and recorder, the PREVIEW button and the AUTO EDIT button light to indicate that you can conduct a preview or edit.

Note

If you set four or more edit points on the player and recorder, the DELETE button flashes. You cannot conduct an edit when the unit is in this state. Delete the unneeded edit points.

For details, see "Modifying Edit Points" on page 55.

To set audio IN points separately from video IN points (audio split editing)

In insert editing, press the AUDIO IN button together with the ENTRY/SHIFT button at the point you want to set as the audio IN point.
The audio IN point is set and the AUDIO IN button lights.

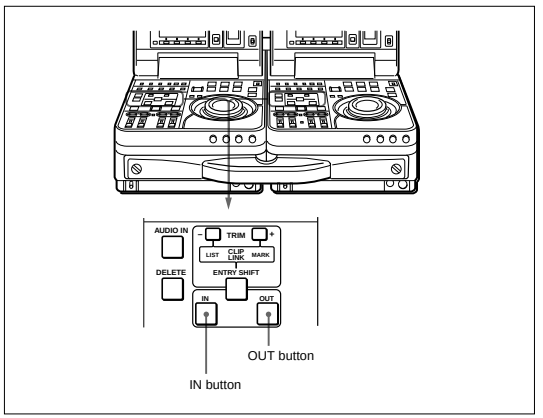
Setting Edit Points

Checking Edit Points

You can check the time data of edit points and the duration between two edit points by displaying them in the sub LCD.

To display the time data of edit points

Press the recorder side or player side IN or OUT button.



While the button remains pressed, the time data for the corresponding edit point is displayed in the sub LCD.

To display the duration between two edit points

From among the recorder side and player side IN buttons (or AUDIO IN buttons) and OUT buttons, press two of the buttons together.
The duration appears in the sub LCD while the buttons are kept pressed.
In some cases, negative durations preceded by a minus sign (–) may be displayed.

The displayed durations are calculated as follows.

When two edit points are set: The duration between the two edit points
When only one edit point is set: The duration between the edit point and the current tape position
When no edit points are set: The duration of the most recently set edit points

Cuing Up Edit Points

You can cue up any edit point, or cue up a position located a specified amount of time before the edit start point (preroll).

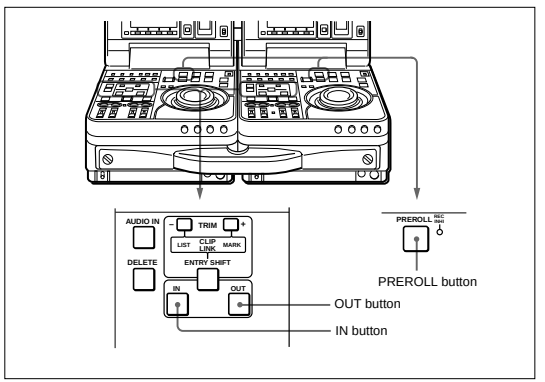
To set the preroll time
Using the setup menu item 001, specify how many seconds (the preroll time) in advance of the edit start point to set the preroll point.
The factory default preroll time is 5 seconds.

For details, see page 102.

Use the following procedures to cue up an edit point or preroll the tape.

To cue up an edit point

Press and hold the recorder side or player side IN or OUT button, and press the recorder or player PREROLL button while holding the IN or OUT button.

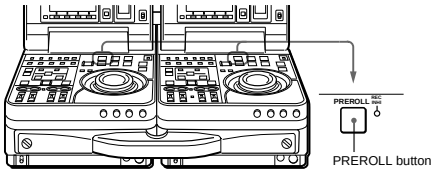


The tape runs to the IN point or OUT point and stops.

Setting Edit Points

To preroll the tape

Press the recorder side or player side PREROLL button.

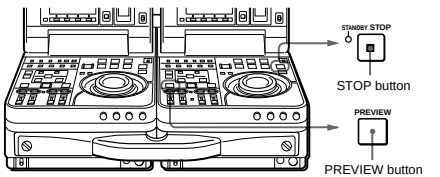


The tape runs to the preroll point, located in advance of the edit start point by the specified amount of time, and then stops.

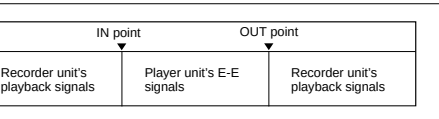
Previewing Edit Results

When you finish setting the edit points, the PREVIEW button flashes to indicate that you can conduct a preview.

To conduct a preview, press the recorder side PREVIEW button, turning it on.



During the preview, you can see the video in the recorder side LCD monitor and listen to the audio through the recorder side speaker. The figure below shows the video and audio signals which can be monitored.



After the preview, modify, delete, or reset edit points as required.

For more information about modifying edit points, see "Modifying Edit Points" on page 55.

To stop a preview
Press the STOP button on the recorder.
The tape stops when the button was pressed.

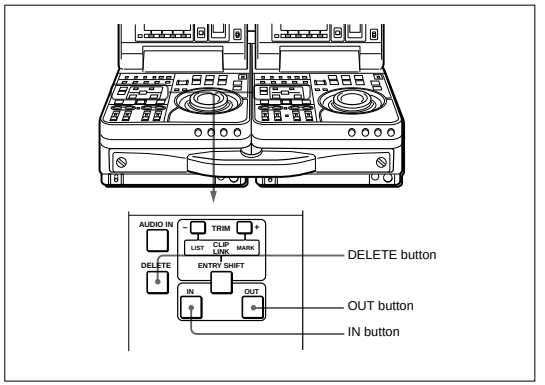
Modifying Edit Points

Once you set edit points, you can delete them or modify them as required in units of one frame.
When edit points have been set incorrectly, for example when an OUT point is located before an IN point or when the durations of editing segments on the player and recorder do no match, the DELETE buttons flash to alert you that a preview or edit cannot be conducted. Correct the edit points as required.

To turn a flashing DELETE button off without deleting an edit point
Press the DELETE button.

To delete an edit point

Proceed as follows.

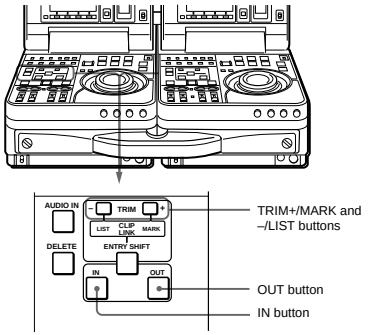


Press the flashing DELETE button together with the IN button or the OUT button.
The DELETE button stops flashing, and the edit point is deleted.

Setting Edit Points

To modify edit points slightly

Proceed as follows.



1 While pressing the recorder side or player side IN or OUT button, depending on the edit point that you want to modify, press a TRIM button (+/MARK or –/LIST) on the same side of the control panel.

The edit point time data is displayed.
Each time you press the +/MARK button, you advance one frame, and each time you press the –/LIST button you return one frame.

2 After making the modifications, press the IN or OUT button that you pressed in step **1**.

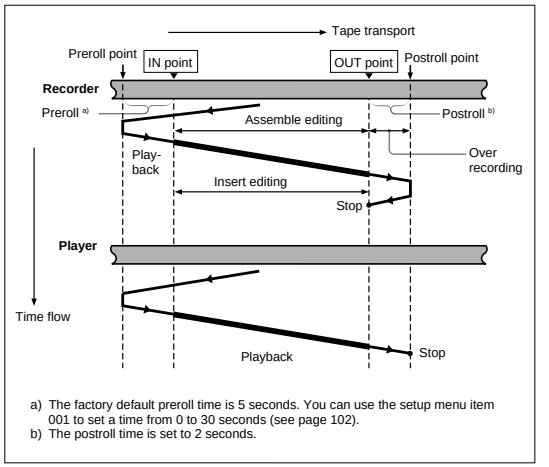
Setting Edit Points Using the Recorder Only

If you press the PLAYER button to light the PLAYER indicator on the control panel, you can operate the player or an external VCR with the recorder side buttons, and set edit points.
In this case, it is recommended that you set setup menu item 006 “LOCAL FUNCTION ENABLE” to ST&EJ (default setting) on the player beforehand *(see page 102)*.

Executing an Edit

Outline of Editing Operations

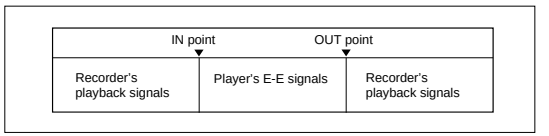
The figure below shows how the recorder and player operate during edit.



a) The factory default preroll time is 5 seconds. You can use the setup menu item 001 to set a time from 0 to 30 seconds (see page 102).
b) The postroll time is set to 2 seconds.

Monitoring signals during an edit

Just as during a preview, you can see the video in the recorder side LCD monitor and listen to the audio through the recorder side speaker.
The figure below shows the video and audio signals which can be monitored.



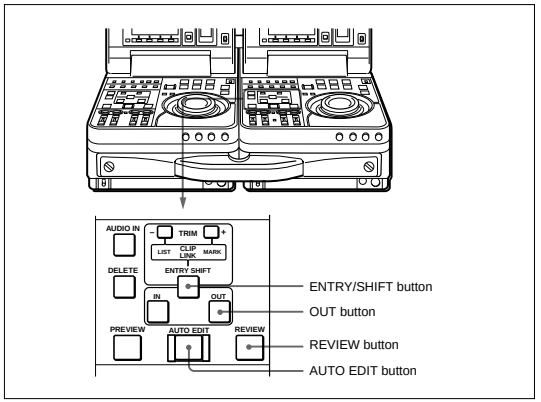
Note

For insert editing, the tape set on the recorder must be a recorded one. You cannot perform insert editing on a blank tape.

Executing an Edit

Starting an Edit

To start an edit, press the AUTO EDIT button.



The AUTO EDIT button is lit during an edit. It goes out when the edit finishes.

To stop an edit

Press the ENTRY/SHIFT button together with the OUT button.
The edit ends, and the point where you pressed the buttons becomes the OUT point.

To abort an edit

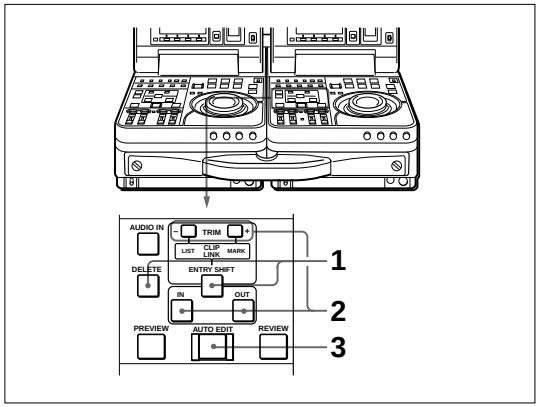
Press the STOP button on the recorder.

To review the edit results

Press the REVIEW button.
When the review ends, the tape returns to the OUT point and stops.

Redoing an Edit

Edit point data is retained even after you execute an edit, until you set new edit points.
You can redo an edit after modifying the edit point data.



1 Press the recorder side DELETE button together with the ENTRY/SHIFT button.

2 Modify the edit points.

See "To Modify edit points slightly" (page 56) for the procedure.

3 Press the AUTO EDIT button.

Chapter 4

Time Data and Sub LCD Menu

Setting Time Data

This unit provides the following timecode functions:
- Setting, displaying, recording, and playing back timecode and user bit values
- Outputting the timecode read from the tape as an analog timecode (LTC) signal during normal-speed playback
- Inputting an external analog timecode (LTC) signal

Information Displayed on the LCD Monitor

The LCD monitor displays setup menus, error messages, alarm messages, time data, and information about the unit's operating status.

For more information about the setup menus, see Chapter 7 "Setup Menu" (page 101).

To adjust the screen

Use the BRIGHT and CONTRAST knobs to adjust the brightness and contrast of the LCD monitor screen.
To make the backlight brighter, set the BACKLGT in the sub LCD menu to HIGH *(see page 74)*.

To display superimposed text information

To display superimposed time data and text information about the operating status of the unit in the LCD monitor, set the CHARACTER switch to ON *(see page 19)*. The setup menu and error messages are displayed regardless of the setting of the CHARACTER switch.
When the CHARACTER switch is set to ON, the text information is also superimposed on the output of the VIDEO OUTPUT 2 (SUPER) connector .

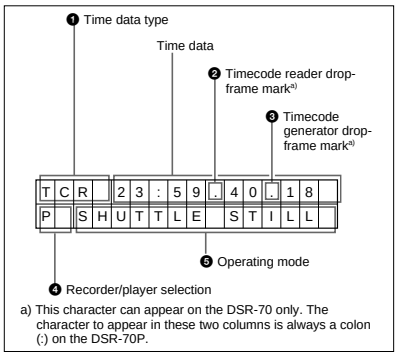
To adjust the displayed text
You can adjust the position, size, and type of superimposed information using setup menu items 002, 003, 009, and 011.

For details, see pages 102 and 103.

Setting Time Data

Information displayed

The figure below shows the time data and operation status that can be superimposed.



a) This character can appear on the DSR-70 only. The character to appear in these two columns is always a colon (:) on the DSR-70P.

Note

The example above shows the factory default configuration.
You can use setup menu item 005 to display a different type of time data in the second line as well.

For details, see page 102.

❶ Time data type

Display	Meaning
CNT	Count value of the time counter (COUNTER)
TCR	Timecode reader timecode data
UBR	Timecode reader user bits data
TCG	Timecode generator timecode data
UBG	Timecode generator user bits data
IN	IN point time data
OUT	OUT point time data
AI	Audio IN point time data
DUR	The duration between any two of the three edit points (IN, OUT, AUDIO IN)
T*R	Time code data from time code reader. The asterisk indicates an interpolation by the time code reader to make up for the time code data not correctly read from the tape.
U*R	User bit data from the time code reader. The asterisk indicates that last data is retained by the time code reader, as the new data has not been read correctly from the tape.

❷ Timecode reader drop-frame mark (for DSR-70 only)

.	Drop frame mode (factory default setting)
:	Non-drop frame mode

❸ Timecode generator drop-frame mark (for DSR-70 only)

.	Drop frame mode (factory default setting)
:	Non-drop frame mode

❹ Recorder/player selection

The indication changes depending on the status of the RECORDER/PLAYER indicators.

No display: When the RECORDER and PLAYER indicators are both not lit.
P: The PLAYER indicator is lit.
R: The RECORDER indicator is lit.

❺ Operating mode

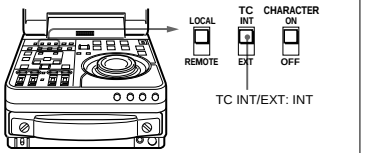
The ■ mark, indicating an auto editing segment, may appear at the rightmost position.
The contents displayed other than the ■ mark are listed on next page.

Display	Operating Mode
CASSETTE OUT	No cassette loaded
TAPE UNTHREAD	Tape not yet threaded
STANDBY OFF	Standby off mode
T. RELEASE	Tension release mode
STOP	Stop mode
F. FWD	Fast forward mode
REW	Rewind mode
PREROLL	Preroll mode
PLAY	Playback mode (servo unlock)
PLAY LOCK	Playback mode (servo lock)
REC	Recording mode (servo unlock)
REC LOCK	Recording mode (servo lock)
SEQ REC	Sequential recording mode (servo unlock)
SEQ REC LOCK	Sequential recording mode (servo lock)
EDIT	Editing mode (servo unlock)
EDIT LOCK	Editing mode (servo lock)
JOG STILL	Jog mode still playback
JOG FWD	Forward jog
JOG REV	Reverse jog
SHUTTLE +2.0	Shuttle mode (playback speed)[a]
PREVIEW	Preview mode
AUTO EDIT	Auto edit mode
REVIEW	Review mode

a) "+2.0" in the left box is an example of playback speed indication.

Setting an Initial Value and Recording Timecode

Set the switches and sub LCD menu items as shown below.

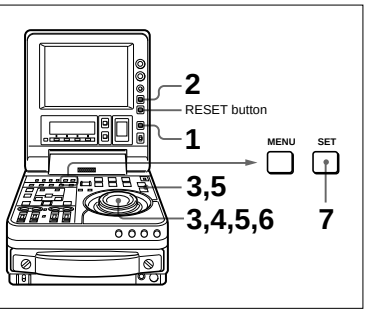


Sub LCD menu settings

Item	Setting
F-RUN/R-RUN	Desired setting
DF/NDF (general settings page)	Desired setting (for DSR-70)

To set an initial timecode value

Perform the following procedure.



1 Press the COUNTER SELECT button and select TC.

(Continued)

2 Press the HOLD button.

The first digit of the time data (hours:minutes:seconds:frames) in the sub LCD begins to flash.

To set all digits to 0
Press the RESET button.

3 Confirm the JOG indicator lights, and select jog mode if not. (Shuttle mode is not recommendable.)

4 Select the digit to set by rotating the jog dial.

The flashing digit changes to the digit on the right when you rotate the jog dial clockwise, and to the digit on the left when you rotate it counterclockwise.

5 Set the value for the flashing digit by rotating the jog dial while pressing the search button.

6 Repeat steps **4** and **5** until you finish setting all digits.

7 Press the SET button.

If the F-RUN/R-RUN item is set to F-RUN, the timecode starts to advance immediately.

To set timecode to the current time

1 Set the F-RUN/R-RUN item to F-RUN and the DF/NDF in the sub LCD menu to DF (for DSR-70) *(see page 73)*.

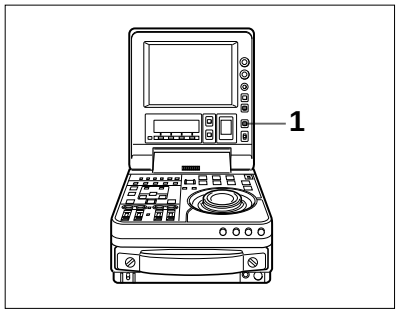
2 Carry out steps **1** to **6** of "To set an initial timecode value" (on previous page) to set the timecode to a time slightly ahead of the current time.

3 Press the SET button at the instant when the current time matches the displayed timecode.

To set user bits

You can record up to 8 hexadecimal digits of information (date, time, event number, etc.) in the timecode track.

Proceed as follows.



1 Press the COUNTER SELECT button and select UB.

2 Carry out steps **2** to **7** of "To set an initial timecode value".

Settings are made in hexadecimal (0, 1, 2,... 8, 9, A, B,... E, F).

Synchronizing the Internal Timecode Generator With an External Signal — External Lock

You can synchronize the internal timecode generator of this unit by inputting an external timecode signal (LTC).

To synchronize to an external timecode signal

Connect the external timecode (LTC) signal to the TC IN connector, and set the TC INT/EXT switch to the EXT position.
This starts the synchronization of the internal timecode generator to the external timecode signal. Once the synchronization is achieved, the internal timecode generator continues to be synchronized even when the external timecode signal is disconnected.

Note

When the input mode is SDTI or i.LINK (the SDTI or i.LINK indicator is present in the subsidiary LCD), then setting the TC INT/EXT switch to the EXT position automatically synchronizes the internal timecode generator to the timecode transferred through the SDTI (DSBK-150) or i.LINK (DSBK-140) interface.

Note that when the TC INT/EXT switch is set to EXT, the advance mode and frame count mode (DSR-70 only) are automatically set as follows.
Advance mode: free running
Frame count mode (DSR-70 only): the same as the external timecode signal (drop frame or non-drop frame)

Checking the synchronization to the external signal

Press the STOP button to stop this unit, then press the REC/SEQ button.
Watch the time counter display, and check that the values displayed coincide with the external timecode values.

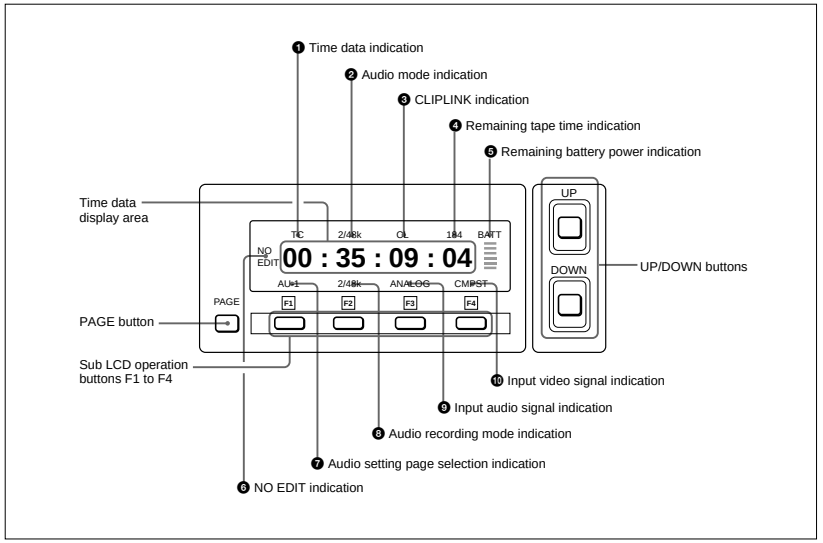
Chapter 4 Time Data and Sub LCD Menu

Sub LCD Menu Display and Settings — Making Operating Mode and Video/Audio Signal Settings

The sub LCD menu displayed in the sub LCD allows you to make operating mode and video/audio signal settings for the unit.

Sub LCD Menu Home Page and Sub LCD Operation Buttons

The home page of the sub LCD menu is displayed when you power the unit on.



❶ Time data indication
Shows the type of time data being displayed.
TC: Timecode
UB: User bits
CNT: Counter count

❷ Audio mode indication
This shows the mode in which audio is recorded.
2/48k: two-channel, 48 kHz mode
4/32k: four-channel, 32 kHz mode
– – : recording mode cannot be determined

❸ CLIPLINK indication
These show whether or not cassette memory is present and whether there is CLIPLINK log data.
CM: appears when there is cassette memory
CL: appears when the cassette memory includes CLIPLINK log data.
No indication: when there is no cassette memory

❹ Remaining tape time indication
Displays the remaining tape time (in 2-minute increments).
–: No cassette is loaded.
When the remaining time falls to 2 minutes or less, the indication becomes 0 and flashes.
When a tape recorded in DV format (SP mode) is played back, indication "SP" appears.

❺ Remaining battery power display
Displays the remaining battery power on a scale of seven levels. When the power is nearly exhausted, the BATT display flashes. When the power is completely exhausted, a flashing E (End) appears.

Regarding the remaining battery power indication, also see the sections "❸ BAT-END (battery end) setting" and "❹ BAT-NE (battery near end) setting" on page 74.

❻ NO EDIT indication
Appears when a tape recorded in DV format is played back.
You may play back a tape recorded in DV format, but you cannot record the results of editing on the tape. This indication appears also when the audio recording mode set on the unit is different from the audio recording mode used on the tape.

❼ Audio settings page selection indication
To select one of the groups of the audio settings pages (AU-1 to AU-4) or MIX/SWP, press F1 to highlight this display, then press the UP or DOWN button. The selected page in the group or the audio settings sub page appears when you press the PAGE button.

For details, see the next section, "To switch between menu pages on the next page".

❽ Audio recording mode indication
When changing the audio recording mode selection, use F2 to highlight this indication, then press the UP button or the DOWN button so that the indication for the desired mode appears in the sub LCD.
2/48k: Two-channel, 48-kHz mode
4/32k: Four-channel, 32-kHz mode
Pressing first F2 to highlight this indication, then the PAGE button displays the general settings page (1) *(see page 73).*

❾ Input audio signal indication
When changing the input audio signal selection, use F3 to highlight this indication, then press the UP button or the DOWN button repeatedly so that the indication for the desired signal appears in the sub LCD.
When none of the optional DSBK-140, DSBK-150 and DSBK-160 boards is installed in the unit, ANALOG is always selected.
ANALOG: Analog signals
i.LINK: i.LINK(DV) signals (DSBK-140)
SDTI: SDTI(QSDI) signals (DSBK-150)
SDI: SDI signals (DSBK-160)
If a signal not connected to the unit is selected, the indication flashes.
Pressing F3 to highlight this indication, then pressing the PAGE button displays the general settings page (1) *(see page 73).*

❿ Input video signal indication
You can select CMPST (composite) or SDI as the input video signal by pressing F4 to highlight this display and then pressing the UP or DOWN button.
CMPST: Composite signal
SDI: SDI signal
S VIDEO: S-video signal
i.LINK: i.LINK (DV) signal (DSBK-140)
CMPNT: Component signal (DSBK-170)
SDTI: SDTI (QSDI) signal (DSBK-150)
If you press the PAGE button after highlighting this display, the video settings page appears, allowing you to make advanced video settings.

For details, see the section, "To switch between menu pages on the next page".

Note

Selecting the i.LINK or SDTI (QSDI) signals for input audio causes the same to be automatically selected also for input video.
Selecting the i.LINK or SDTI (QSDI) signals for input video causes the same to be automatically selected also for input audio.

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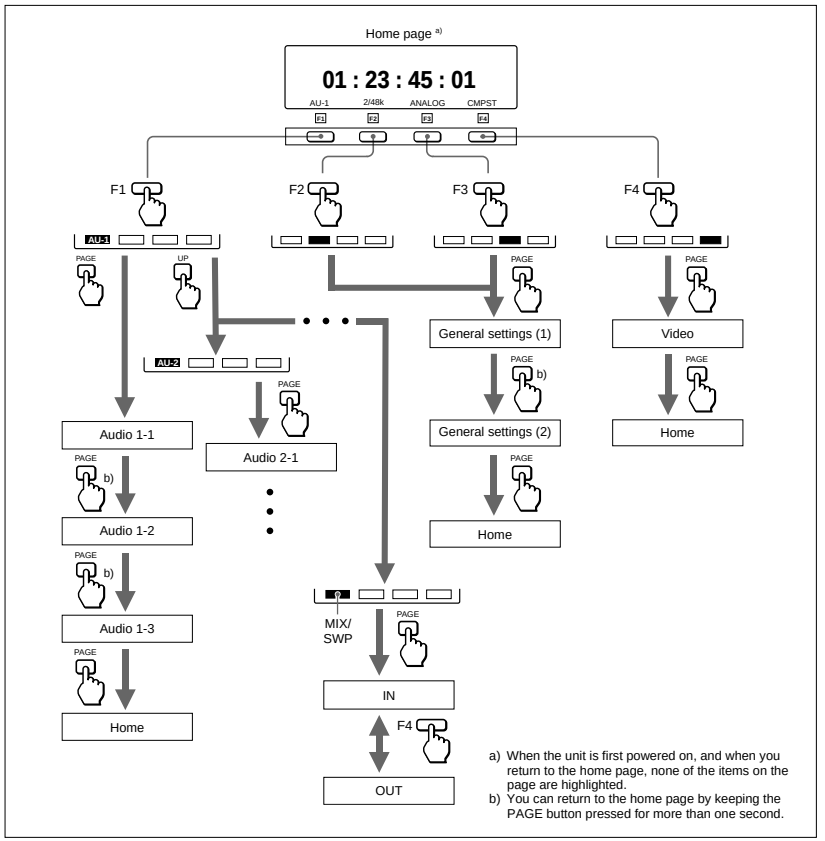
Sub LCD Menu Basic Operations

To switch between menu pages

In addition to the home page, the sub LCD menu has pages that allow you to make settings for input and output of video and audio signals, and other general settings.
You can switch between pages by pressing the buttons shown in the figure below.

For more information about the video and audio settings pages, see the section "Sub LCD Menu Display and Settings" on page 66.



a) When the unit is first powered on, and when you return to the home page, none of the items on the page are highlighted.
b) You can return to the home page by keeping the PAGE button pressed for more than one second.

To select an item

Display the page that contains the item you want to select, then press F1 to F4, that is located in the same column as the item.

The selected item is highlighted.
Press the button repeatedly until the item that you want to select is highlighted.

To change a setting

With the item that you want to change highlighted, press the UP or DOWN button repeatedly until the item is set to the value that you want.

Input and Output Settings for Video and Audio Signals — Sub LCD Menu

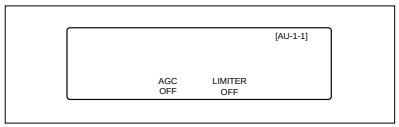
Using the sub LCD menu, you can make settings related to the input and output of video and audio signals.

For more information about basic sub LCD menu operations, see section "Sub LCD Menu Basic Operations (see page 68)".

Making Settings in the Audio Settings Pages

For audio settings, use the audio settings pages of the sub LCD menu.
The audio settings pages are divided into four groups, AU-1 to AU-4. Using these four groups of audio settings pages, you can make four different sets of audio settings. To call up one of the settings pages in a group, select the group from the home page.
Each settings page has a number that indicates its group and its position within the group. For example, audio settings page 1-1 is the first page in group AU-1.

Audio settings page 1-1



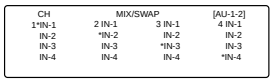
Item	Setting
AGC	Turn the audio input AGC circuits ON and OFF (enabled when the AUDIO INPUT PRESET/VARIABLE switch of the control panel is set to PRESET).
LIMITER	Turn the audio input limiter circuits ON and OFF (enabled when the AUDIO INPUT PRESET/VARIABLE switch of the control panel is set to VARIABLE).

To switch to audio settings page 1-2
Press the PAGE button.

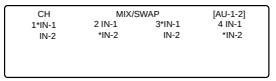
Audio settings page 1-2

Audio settings page 1-2 displayed differs between when the optional DSBK-140/150/160 board is installed and when it is not installed.

Display when the optional DSBK-140/150/160 board is installed



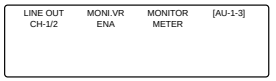
Display when the optional DSBK-140/150/160 board is not installed



Item	Setting
MIX/SWAP CH 1 to 4	Select up to two audio input signals (IN-1 to IN-4) to be assigned to channels 1 to 4. When two signals are selected, they are mixed. **To select** **1** Select the desired channel using operation buttons F1 to F4. **2** Press the same operation button as used in **1** repeatedly until the input signal indication (IN-1/IN-2/IN-3/IN-4) corresponding to the desired signal is highlighted. **3** With the input signal indication for the selected signal highlighted, press either the UP button or the DOWN button so that an asterisk (*) is added to the highlighted input signal indication. **4** To select the second input signal for the same channel, repeat steps **2** and **3**. **To cancel the selection** Proceed as above to highlight the desired input signal indication, then press either the UP button or the DOWN button so that the asterisk preceding the highlighted input signal indication disappears. **Note** When analog audio (ANALOG) has been selected for input, selecting IN-3 or IN-4 as the audio input signal results in mute audio.

To switch to audio settings page 1-3
Press the PAGE button.

Audio settings page 1-3



Item	Setting
LINE OUT	Select channels 1/2 or 3/4 as the line out channels.
MONI.VR	Select ENA for an output level determined according to the setting of the PB AUDIO PRESET/VARIABLE switch of the control panel, or DIS for a fixed output level.
MONITOR	Select the monitor audio output signal. • Select METER to linking the monitor audio output selection to the setting of the METER switch for the display panel. Either channels 1 and 2 mixed or channels 3 and 4 mixed will be output. • When not linking the monitor audio output selection to the setting of the METER switch, select the desired channel (CH-1/CH-2/CH-3/CH-4).

Audio settings pages 2-1 to 4-3

Make settings in the same way as pages AU-2 to AU-4.

Making Settings in the Audio Settings Subpages

Use the audio settings subpages to make mix and swap input and output settings for channels 1 and 2.

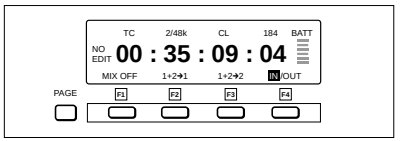
To display the audio settings subpages

1 Press F1 to highlight the audio settings item in the home page.

2 If the item displayed is not "MIX/SWP", press the UP button until "MIX/SWP" appears.

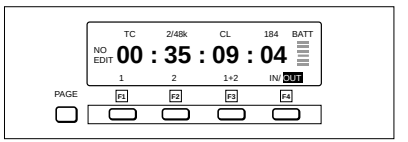
3 Press the PAGE button.

An audio settings subpage (input mixing page) appears as shown below.



To switch pages

Press the F4 button.
An output monitor settings page like the one below appears.



Each press of the F4 button switches between the input mixing settings page and the output monitor settings page.

To return to the home page
Press the PAGE button.

Contents of the audio settings subpages

When you change the settings of the audio settings subpages, the settings of the AU-1 page change as well, and vice versa.
However, when there is no item in the subpages corresponding to a setting made in the AU-1 page, the setting is not reflected in the subpages.

Chapter 4 Time Data and Sub LCD Menu

Input and Output Settings for Video and Audio Signals –– Sub LCD Menu

Input mixing settings page

By pressing F1 to F3, you can make the following three settings for mixing of input signals in audio channels 1 and 2. The selected setting is highlighted. To select input signals, use audio settings page 1-2.

MIX OFF: Assign IN-1 to channel 1, and assign IN-2 to channel 2.

1+2 → 1: Assign mixed signals of IN-1 and IN-2 to channel 1, and assign IN-2 to channel 2.

1+2 → 2: Assign IN-1 to channel 1, and assign mixed signals of IN-1 and IN-2 to channel 2.

Output monitor settings page

By pressing F1 to F3, you can make the following three settings for monitor output signals. The selected setting is highlighted.

1: Assign channel 1 to monitor output.

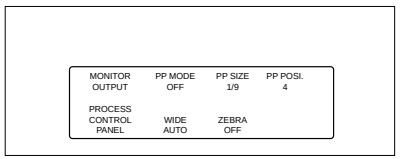
2: Assign channel 2 to monitor output.

1+2: Assign mixed signals from channels 1 and 2 to monitor output. (This corresponds to the MONITOR item setting "METER" in audio settings page 1-3.)

Making Settings in the Video Settings Pages

The following tables show the items that can be set in the video settings pages.

Video settings page



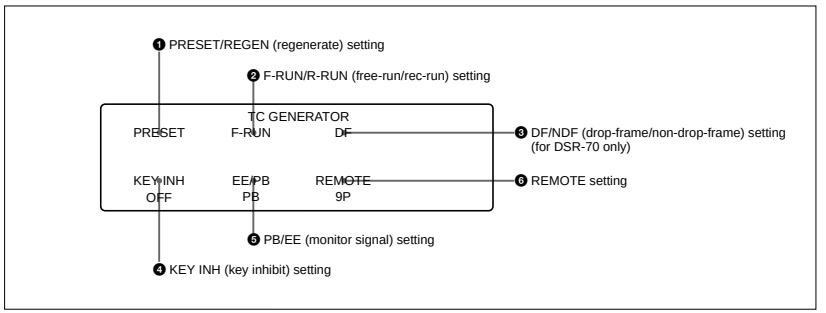
Item	Setting
MONITOR[a)]	When composite video (CMPST) has been selected for input, select the E-E signal for output to the LCD monitor of the unit. **INPUT:** Input video E-E with no digital process delay is output. **OUTPUT:** Output video E-E with a digital process delay is output
PP MODE[a)]	Select how to display two input pictures on the LCD monitor. **OFF:** Not displaying two pictures. **1:** Picture-in-picture display **2:** Two pictures reduced and displayed side by side **3:** Side-by-side display reduced in horizontal direction only
PP SIZE[a)]	Select the size of the smaller picture to be inset for picture-in-picture display on the LCD monitor. **1/16:** $^1/_{16}$ the normal size **1/9:** $^1/_9$ the normal size **1/4:** $^1/_4$ the normal size
PP POSI.[a)]	Select the position of the smaller picture to be inset for picture-in picture display on the LCD monitor. **1:** Upper left position **2:** Upper right position **3:** Lower left position **4:** Lower right position
PROCESS CONTROL	Select what to use to control the following items: SETUP (when using the setup menu) or PANEL (when using the front control section). • Video output level • Chroma signal output level • Setup level (DSR-70)/black level (DSR-70P) • Chroma phase
WIDE	Select whether to record/play back video with wide-screen aspect ratio information requiring the LCD monitor to switch to 16:9 mode. **AUTO:** The LCD monitor automatically switches to 16:9 mode when wide screen video is input or played back. **ON:** The LCD monitor is always in 16:9 mode. **OFF:** The LCD monitor does not switch to 16:9 mode.
ZEBRA	Set the zebra pattern to be displayed in the LCD monitor. **OFF**: Do not display. **50%**: Display zebra pattern with 50% or more video level. **80%**: Display zebra pattern with 80% or more video level. **100%**: Display zebra pattern with 100% or more video level.

a) Displayed only when the DSBK-180/180P Dual Video Input Board installed

General Settings Pages of the Sub LCD Menu

There are general settings pages (1) and (2).

General settings page (1)



❶ PRESET/REGEN (regenerate) setting

Selects the value set in the internal timecode generator.

PRESET: Preset the initial value of the timecode generated by the internal timecode generator, either by a control panel operation or by remote control from the device connected to the REMOTE connector.

REGEN: Synchronize the internal timecode generator with the timecode read by the internal timecode reader.

❷ F-RUN/R-RUN (free-run/rec-run) setting

Selects the progression method for the timecode generated by the internal timecode generator.

F-RUN: Timecode progresses continuously from the time when this unit is powered on, regardless of the unit's operating status.

R-RUN: Timecode progresses only during recording.

❸ DF/NDF (drop-frame/non-drop-frame) setting (for DSR-70 only)

Selects DF to advance timecode in drop-frame mode, and NDF to advance timecode in non-drop-frame mode.

❹ KEY INH (key inhibit) setting

Set to ON to disable the buttons on the control panel. (Sub LCD menu operations can still be performed even when this item is set to ON.)

You can select the buttons that are disabled under setup menu item 118.

If you try to operate the disabled buttons, the message "!!KEY INH.!" appears in the time data display area on the sub LCD.

❺ PB/EE (monitor signal) setting

Selects the video/audio signal output when the tape is being fast forwarded or rewound, or when the unit is stopped or on standy .

PB: Playback signal

PB/EE: Input signal in E-E mode

❻ REMOTE setting

When the REMOTE/LOCAL switch is set to REMOTE, selects the source for control of this unit.

9P: The unit is controlled from the device connected to the REMOTE connector (D-sub9-pin).

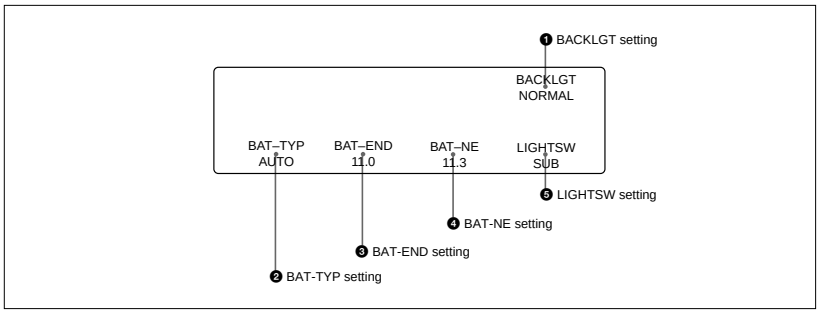
i.LINK: The unit is controlled from the device connected to the DV IN/OUT connector (DSBK-140).

To switch to general settings page (2)

Press the PAGE button.

General Settings Pages of the Sub LCD Menu

General settings page (2)



❶ BACKLGT (back light) setting
Set to HIGH to increase the brightness of the LCD monitor back light.

❷ BAT-TYP (battery type) setting
Set the type of the battery used.
AUTO: The battery type is automatically checked.
Ni: BP-90/90A
Li: BP-L60/L60A/L90/L90A
ANTON: Anton Bauer Magnum battery

Note

To use the Anton Bauer Magnum battery, you require a special battery mount to be attached to this unit.

For more information about the special battery mount, contact an Anton Bauer agent or your Sony dealer.

❸ BAT-END (battery end) setting
Set a voltage value to indicate the shutdown voltage of this unit.

❹ BAT-NE (battery near end) setting
For alarms that alert you when the end of power as specified in the battery end setting ❸ is near, specify a voltage that at which to begin the alarm display.

❺ LIGHTSW (backlight control switch) setting
Controls back light power of the LCD monitor and sub LCD.
SUBMAIN: The both are controlled by the LIGHT switch.
MAIN: The LCD monitor backlight power is controlled by the LIGHT switch. The sub LCD backlight power is continually on.
SUB: The sub LCD backlight power is controlled by the LIGHT switch. The LCD monitor backlight power is continually on.

Chapter 5

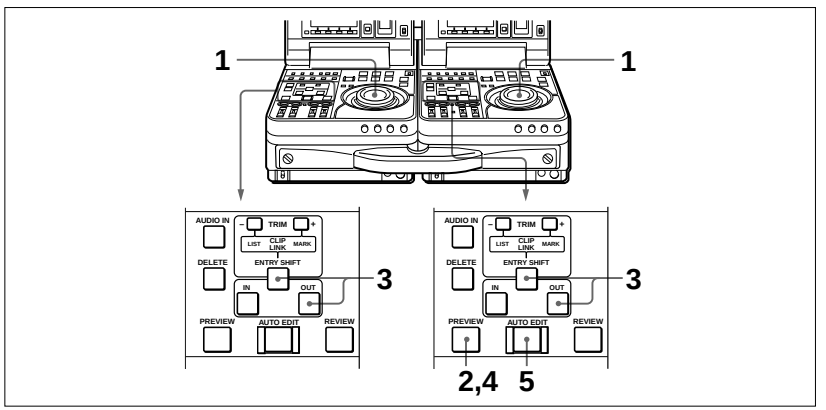
Special Editing and Recording/Playback

Special Editing

This section explains the following kinds of editing.
• Quick editing
• Continuous editing
• Manual editing
In the subsequent explanation of operations in this chapter, illustrations of a pair of DSR-70/70P units (player and recorder) combined using the optional BKNW-225 Docking Kit are used *(see page 125)* . In each illustration, as viewed from the front, the unit on the left is the player and the unit on the right is the recorder.

Quick Editing

After selecting the edit mode, you can work more efficiently by using quick editing, which allows you to set edit points and preview at the same time. Proceed as follows.



Special Editing

1 Stop the tapes at the points where you want to set the recorder side and player side IN points.

2 Press the recorder side PREVIEW button.

A preview starts. The points selected in step **1** are set as the IN points, and the IN buttons of the recorder and player light.

3 While monitoring the player video and audio, at the point where you want to set the OUT point, press the recorder side or player side OUT button together with the ENTRY/SHIFT button.

The OUT point is set, and the OUT button that you pressed lights.

Note

Setting an OUT point while viewing the recorder video and audio will shift the OUT point due to the time taken by digital processing (process delay) carried out on the recorder side.

4 Conduct another preview and modify the edit points as required.

5 Press the AUTO EDIT button.

The edit starts.
When the edit finishes, the recorder stops at the OUT point and player stops about 2 seconds after the OUT point.

To edit even more quickly

1 Stop the tapes at the points where you want to set the recorder side and player side IN points.

2 Press the AUTO EDIT button.

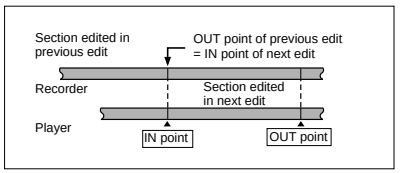
The edit starts.

3 While monitoring the player video and audio, when you reach the point you want to set as the OUT point, press the player side or recorder side OUT button together with the ENTRY/SHIFT button.

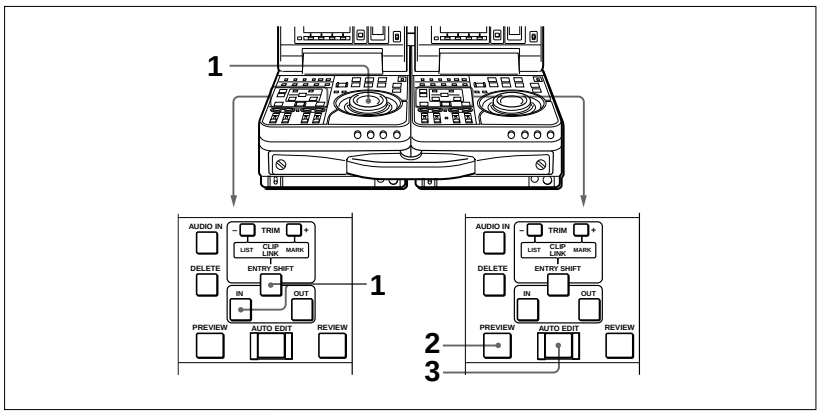
The point where the edit started is set as the IN point, and the point where the pressed the OUT and ENTRY/SHIFT buttons is set as the OUT point.

Continuous Editing

When you execute multiple edits in succession, you can edit from the second time on by setting the IN and OUT points of the player side only.
After execution of an edit, the recorder returns automatically to the OUT point. Therefore, the recorder side OUT point of the current edit becomes the IN point of the next edit.



Use the following procedure.



1 Set the player side IN point.

2 Press the recorder side PREVIEW button to conduct a preview.

3 Press the AUTO EDIT button.

The edit starts.
When the edit ends, the recorder stops at the OUT point and player stops 2 seconds after the OUT point.

To stop an edit

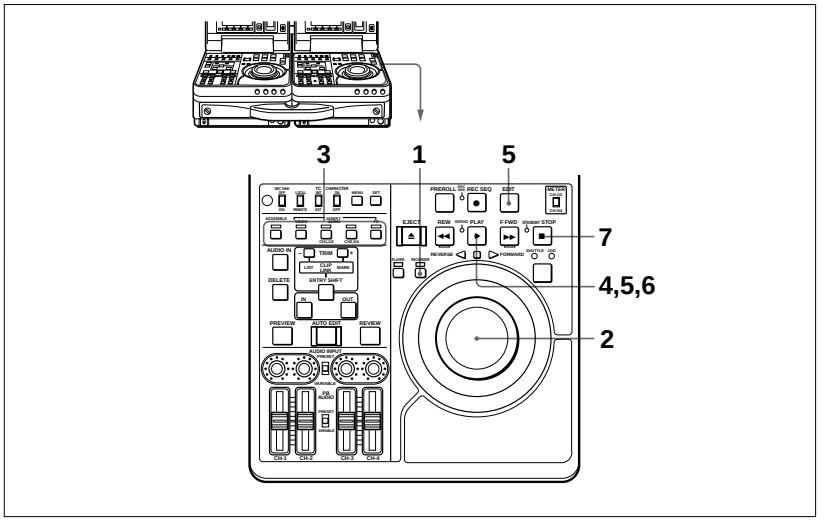
Press the ENTRY/SHIFT button together with the OUT button.
The edit ends, and the point where you pressed the buttons becomes the OUT point.

To abort an edit

Press the STOP button on the recorder.

Manual Editing

Perform manual editing using the recorder.



1 Press the RECORDER button, lighting the indicator.

2 Use the jog or shuttle dial to find the point where the edit will start (the recorder IN point), and stop the tape slightly in advance of this point.

3 Select the edit mode.

4 Press the PLAY button.

Recorder playback starts.

Note

About 2 seconds are required for the picture to stabilize. You should begin playback at a point on the tape more than 2 seconds in advance of the section you will use in the edit.

5 Press the EDIT button together with the PLAY button at the point where you want to start the edit (the recorder IN point).

The edit starts.

6 Press the PLAY button at the point where you want to end the edit (the recorder OUT point).

The edit ends but recorder playback continues.

7 Press the STOP button to stop recorder playback.

Recording

This section describes recording of external input signals using this unit as a recorder.

Notes

- When two DSR-70/70P units are combined, set both REMOTE/LOCAL switches to LOCAL.
- When controlling this unit from the editing control unit connected to the REMOTE connector, set the REMOTE/LOCAL switch to REMOTE.

Preparations for Recording

Perform the following procedure.

1 Connect the source signals.

2 Select video and audio signals which you want to record *(see step **5** on page 39)*.

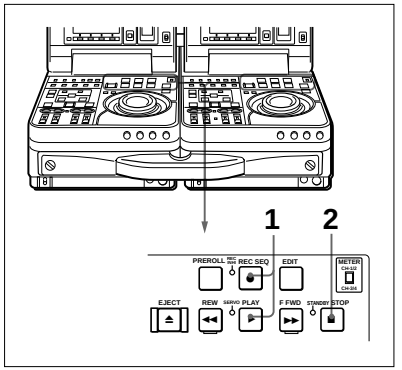
3 Make settings for time data *(see page 61)*.

To adjust audio input levels

Set the AUDIO INPUT PRESET/VARIABLE switch on the control panel to VARIABLE. Turn the AUDIO INPUT CH-1 and CH-2 knobs, monitoring the input levels indicated by audio level meter.

Recording Operation

Confirm that the REC INHI indicator on the control panel is not lit.
Then, follow the procedure below.



1 Press the REC/SEQ and PLAY buttons at the same time.

Recording starts and the POWER indicator turns to red.

2 Press the STOP button to stop recording.

If recording continues to the end of the tape, the tape automatically rewinds to the beginning and stops.

Recording

Sequential Recording Using Two Units

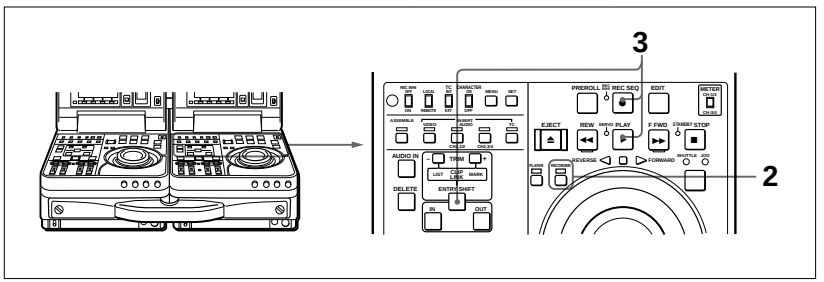
When you combine two DSR-70/70P units, you can perform sequential recording from one unit to another. (In the following explanation of two-unit sequential recording, the controlling unit is referred to as the recorder and the controlled unit as the player.)
For overwriting recording using only two cassettes, the last 6 hours of recording is always available.
By replacing the cassette approximately every 3 hours, indefinite continuous recording is possible.
Sequential recording using two DSR-70/70P units can be performed in the following two ways.

- Inputting external video and audio signals to both the player and recorder.
- Inputting external video and audio signals to the player and inputting the video and audio signals output from the player to the recorder.

In either case, you can use the same operating procedure, but there are some differences in equipment/signal connections and basic settings between the two cases.

For more information about equipment/signal connections and basic settings for two-unit sequential recording, see the section "Connections for Sequential Recording Using Two Units" on page 118.

Use the following procedure. You can do control panel operations on the recorder during sequential recording. Rewind the tape to the top beforehand.



1 Insert the cassettes into the recorder and player.

2 Press the recorder side RECORDER button to light the RECORDER indicator on the recorder.

3 Simultaneously press the recorder side ENTRY/SHIFT button, REC/SEQ button, and PLAY button.

The recorder side begins recording.
The STANDBY indicator of the player goes out.
The POWER indicator turns to orange.

The player starts recording automatically when the remaining time of the recorder side tape reaches 2 minutes.

The setting of setup menu item 014 affects what happens when a tape ends.

When AUTOMATIC OVERWRITE is selected
Endless recording on the same cassette continues, overwriting on the previous contents.

When MANUAL CASSETTE REPLACE is selected
When the tape end is reached, the tape is rewound and the EJECT button begins to flash.
To continue recording, insert a new cassette into the recorder. The recorder will start recording automatically when the remaining time of the player side tape reaches 2 minutes.

To stop sequential recording
Sequential recording stops in the following cases.

- When a tape transport button (PLAY, STOP, F FWD, REW) or a search button is pressed during recording.
- If the cassette is not exchanged when the EJECT button flashes though setup menu item 014 is set to MANUAL CASSETTE REPLACE.

Parallel Recording Using Two Units

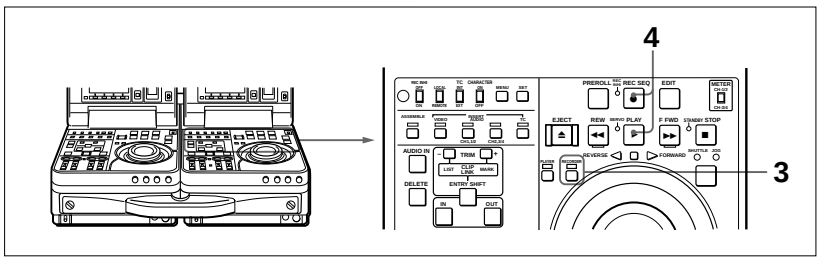
You can connect two DSR-70/70P units and carry out parallel recording between them.
Parallel recording using two DSR-70/70P units can be performed in the following two ways.
(In the following explanation of two-unit parallel recording, the controlling unit is referred to as the recorder and the controlled unit as the player.)

- Inputting an external timecode to both the player and recorder.
- Inputting the timecode generated by the recorder to the player.

There are some differences in equipment/signal connections and basic settings between these two cases.

For more information about equipment/signal connections and basic settings for two-unit parallel recording, see the section "Connections for Parallel Recording Using Two Units" on page 120.

Perform the following procedure.



1 Insert two recording tapes in the recorder and player.

2 When inputting the timecode generated in the rocorder to the player, make the required settings for timecode on the recorder.

For more information about timecode settings, see the section "Setting an Initial Value and Recording Timecode" on page 63.

3 Press the RECORDER button or PLAYER button on the recorder, lighting both the RECORDER and PLAYER indicators on the recorder.

When both the RECORDER indicator and PLAYER indicator are lit, the unit is in parallel running mode.

4 Holding down the REC/SEQ button, press the PLAY button on the recorder.

The recorder and player start recording at the same time.

To stop parallel recording
Press a tape transport button (PLAY, STOP, F FWD, or REW) or the search button on the recorder.

Two-Input Switched Video Recording (Optional DSBK-180/180P Required)

With the optional DSBK-180/180P Dual Video Input Board installed, you can record, switching between the video signals output by two cameras. (Audio signals are not switched.)

For equipment/signal connections and basic settings, see the section "Connections for Two-Input Switched Video Recording" on page 123.

To select display mode

In the video settings page *(see page 72)* of the sub LCD menu, select how to display the pictures from the two cameras on the LCD monitor of this unit.

Selections to be made	Corresponding sub LCD menu items (in the video settings page)
Whether to display two input pictures at the same time and, if to display two pictures, how to arrange them.	PP MODE
If picture-in-picture display is selected with the menu item PP MODE, size and position of the smaller picture.	PP SIZE and PP POSI.

For information about sub LCD menu operations, see the section "Sub LCD Menu Basic Operations" on page 68.

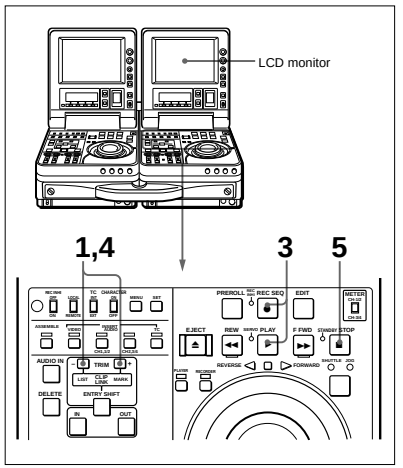
Picture to be recorded

When two-picture display mode is selected, the picture to be recorded is determined as follows.

- When picture-in-picture display is selected:
  The larger picture is recorded.
- When two-picture display other than picture-in-picture is selected:
  The picture displayed on the left (shown in a red frame) is recorded.

Recording procedure

Perform the following procedure.



1 Holding down the +/MARK button, press the –/LIST button.

Each press of the –/LIST button switches the display on the LCD monitor.

2 Make sure that there is no picture discontinuity when the display is switched.

If the picture is deformed at the switching of display
Adjust the output video signal phases between the two cameras.

For the phase adjustment procedure, see the next section.

3 When the picture to start recording with is displayed, hold down the REC/SEQ button and press the PLAY button.

Recording starts.

4 While watching the LCD monitor display, when you wish to switch the display, hold down the +/MARK button and press the –/LIST button.

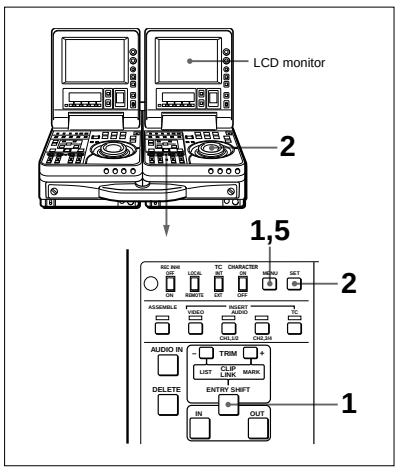
The display on the LCD monitor as well as the picture being recorded is switched.

5 To stop recording, press the STOP button.

Recording stops.

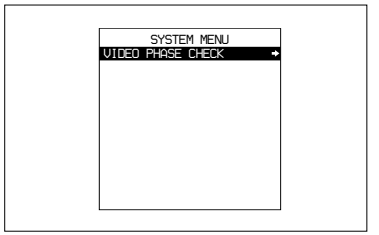
To adjust the output video signal phases

When long cables are used to connect two cameras to this unit, a slight shift in phase between the video signals input from the two cameras may result. When the phase shift is of a significant magnitude, you can detect it as a picture discontinuity on the LCD monitor at the switch between the signals from the two cameras.
To align the phases of the video signals from the two cameras, adjust the phase of the output video signal from one of the two cameras as follows.



1 Holding down the ENTRY/SHIFT button, press the MENU button.

The SYSTEM MENU screen appears on the LCD monitor.



2 Using the jog/shuttle dial, select the VIDEO PHASE CHECK item on the SYSTEM MENU screen, then press the SET button.

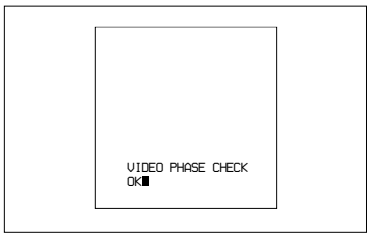
The pictures from the two cameras are alternately displayed on the LCD monitor (switched 30 times per second (DSR-70)/24 times per second (DSR-70P)).

3 If the text displayed on the LCD monitor jitters, adjust the H PHASE (horizontal phase) of one of the two cameras until the text stops jittering. (Luminance signal phase adjustment)

(Continued)

4 If “NG” is displayed on the LCD monitor, adjust the SC PHASE (subcarrier phase) of the camera to shorten the horizontal bar (representing the magnitude of SC PHASE difference between the two cameras) appearing by the “NG” indication.

When the horizontal bar is appropriately shortened, the “NG” changes to “OK”.



5 When the adjustment is completed, press the MENU button to exit from the VIDEO PHASE CHECK menu.

Digitally Dubbing Signals in DVCAM Format (Optional DSBK-140 or DSBK-150 Required)

In addition to straightforward tape dubbing, you can also use this unit to digitally dub signals in DVCAM format automatically from the beginning of the tape to the end, through an i.LINK or SDTI(QSDI) interface. When a tape recorded on a DSR-1/1P Digital Videocassette Recorder or DSR-130/130P Digital Camcorder is dubbed, the ClipLink log data held in the cassette memory is also copied.

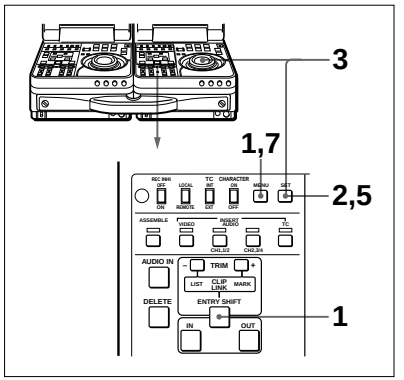
To use an i.LINK interface requires the optional DSBK-140 board, and to use an SDTI(QSDI) interface requires the optional DSBK-150.

For information about connections and basic settings, see the section “Connections for Digitally Dubbing Signals in DVCAM Format” on page 124.

Notes

- Use a tape which is recorded in the DVCAM format. A tape recorded in DV format cannot be used as a source tape for dubbing through an SDTI(QSDI) or i.LINK interface.
- Regardless of the audio recording mode setting of this unit, dubbing is performed with the original audio recording mode unchanged (two-channel mode (48 kHz) or four-channel mode (32 kHz)).
- Approximately the last 2 minutes of the tape may not be copied because of differences in tape lengths. (If an Index Picture is recorded in this portion, it may also not be copied.)
- A continuous recorded section of approximately 5 seconds is required before the recording start point. It is recommended to record beforehand color bars or a similar signal at the start point of the source tape to be dubbed on this unit.

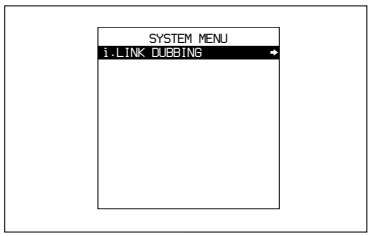
Perform the following procedure.



1 On the recorder, hold down the ENTRY/SHIFT button and press the MENU button.

The SYSTEM MENU screen appears on the LCD monitor.

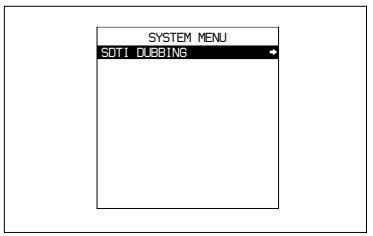
- **SYSTEM MENU screen displayed when using the i.LINK interface (DSBK-140)**



(Continued)

Digitally Dubbing Signals in DVCAM Format (Optional DSBK-140 or DSBK-150 Required)

• **SYSTEM MENU screen displayed when using the SDTI(QSDI) interface (DSBK-150)**



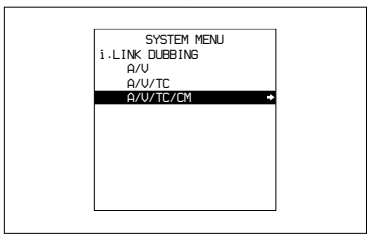
Note

When neither the DSBK-140 nor the DSBK-150 is installed in the unit, the setup menu appears instead of the system menu.

In explaining the subsequent steps of this operating procedure, illustrations of screens shown when using the i.LINK interface are used. You can apply the same operating procedure also when using the SDTI(QSDI) interface.

2 Press the SET button.

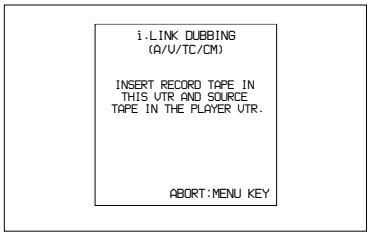
The screen changes as follows, allowing you to select a desired group of items for dubbing.



- **A/V:** Audio and video
- **A/V/TC:** Audio, video and timecode
- **A/V/TC/CM:** Audio, video, timecode, and cassette memroy (ClipLink log data)

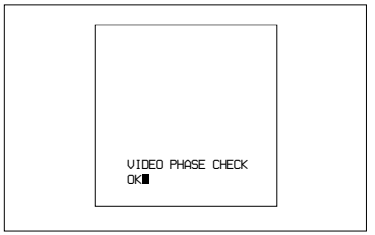
3 Using the jog/shuttle dial, select a desired group of items for dubbing, then press the SET button.

The menu screen changes as follows.
(Example: The screen displayed when A/V/TC/CM is selected.)



4 Insert the source tape in the player and the recording tape in this unit.

A message to make sure dubbing may be started appears.



If the cassette memory capacity of the recording tape is not sufficient

A message urging you to replace the recording tape by a tape with a larger cassette memory capacity appears.

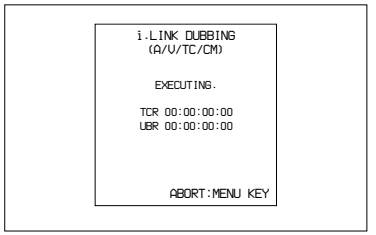
For more information about this, see the next section "If the cassette memory of the recording tape is not large enough".

To cancel the dubbing operation

Press the MENU button.

5 Press the SET button.

The recording tape and source tape are both automatically wound back to the beginning, and dubbing starts. At the same time, the screen changes as follows.



To end the dubbing operation while it is in progress

Press the STOP button.
The dubbing operation stops and a message asking whether to copy the contents of the cassette memory appears.

For more information about this, see the subsequent section "If you end dubbing while it is in progress" on this page.

When dubbing is completed

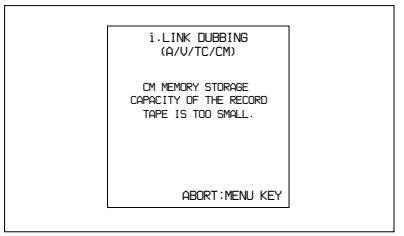
① A message "COMPLETED" appears on the LCD monitor.
② The source tape and recording tape are both automatically rewound to the beginning, and the cassettes ejected.
③ The unit returns to the state in step **3**.

6 To continue by dubbing another tape, repeat steps **4** and **5**.

7 To end the dubbing operation and exit from the menu, press the MENU button.

If the cassette memory of the recording tape is not large enough

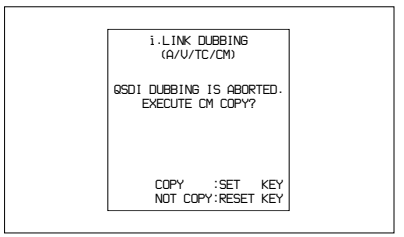
When you insert the recording tape and source tape in this unit and the player, respectively, whereas A/V/TC/CM has been selected as the items for dubbing, their cassette memory contents are checked automatically. If, as a result, the cassette memory capacity of the recording tape is found inadequate, the following message appears.



If this message appears, replace the recording tape by a tape with a larger cassette memory capacity.

If you end dubbing while it is in progress

If you end dubbing while it is in progress with A/V/TC/CM selected as the items for dubbing, the following message appears.



To copy the contents of the cassette memory, press the SET button.
If you do not wish to copy the contents of the cassette memory, press the RESET button. If you press the RESET button, however, the contents of the cassette memory may not agree with the material recorded on the tape.

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Playback

This section describes playback of tapes performed using this unit as a player.

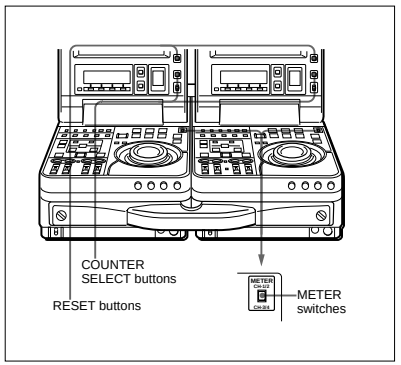
Notes

- When two DSR-70/70P units are combined, set both REMOTE/LOCAL switches to LOCAL.
- When controlling this unit from the editing control unit connected to the REMOTE connector, set the REMOTE/LOCAL switch to REMOTE.

For playback using the jog/shuttle dials, see "Finding Edit Points — Search" (page 49).

Preparations for Playback

Perform the following procedure.



1 Connect video/audio signal output connectors to external equipment if necessary.

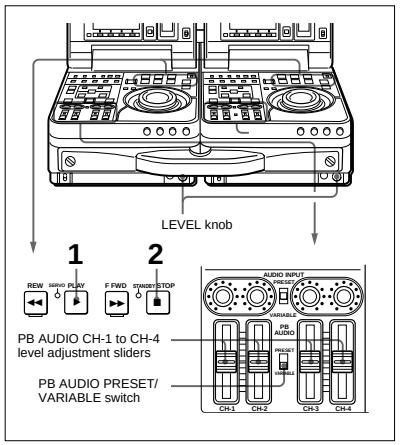
2 Select output audio signals *(see "Audio settings page 1-3 on page 71).*

3 Press the COUNTER SELECT button to select the time data.

When using COUNTER
Press the RESET button to set the value to "0:00:00:00".

4 Set the METER switch to CH-1/2 or CH-3/4 to select the channels indicated by audio level meter.

Playback Operation



1 Press the PLAY button.

Playback starts.

To adjust speaker/headphones audio level
Rotate the LEVEL knob on the front control section.

To adjust audio playback level
Set the PB AUDIO PRESET/VARIABLE switch to VARIABLE, and adjust using the PB AUDIO CH-1 to CH-4 level adjustment sliders.

2 Press the STOP button to stop playback.

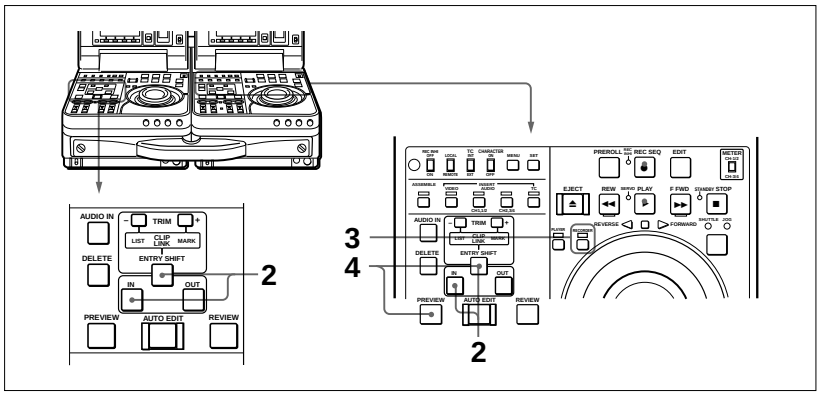
If playback continues to the end of the tape, the tape automatically rewinds to the beginning and stops.

Two-Unit Synchronous Playback

Connecting two DSR-70/70P units and synchronizing their tape transport, you can carry out two-unit synchronous playback with an accuracy of ±0 frame.

For equipment/signal connections and basic settings, see the section "Connections for Two-Unit Synchronous Playback" on page 122.

Perform the following procedure.
(In the following, the controlling unit is referred to as the recorder and the controlled unit as the player.).



1 Insert two source tapes in the recorder and player.

2 Cue up to the tape position where to start playback on each of the recorder and the player, then, holding down the ENTRY/SHIFT button, press the IN button.

On each unit, the cued-up tape position is set as the IN point and the IN button lights.

3 Press the RECORDER button, lighting the RECORDER indicator.

4 On the recorder, holding down the ENTRY/SHIFT button, press the PREVIEW button.

Both the recorder and the player start preroll followed by playback by the two units.
When the setup menu item 004 is set to ON and 305 set to ACCUR on the recorder side, the recorder and player tape transports are synchronized during the preroll allowing two-unit synchronous playback with ±0 frame accuracy to start at the player and recorder IN points.

To end synchronous playback while it is in progress
Press the STOP button on the recorder.

Chapter 5 Special Editing and Recording/Playback

Chapter 6

ClipLink Operation

Overview of ClipLink Operation

The ClipLink function provides the following.
- Displaying ClipLink log data
- Cueing up to Mark IN/OUT points and cue points
- Rewriting ClipLink log data (reel numbers, Mark IN/OUT points, and OK/NG status only)
- Creating additional ClipLink log data and deleting ClipLink log data (Mark IN/OUT points only)
- Automatically creating new ClipLink log data (Mark IN/OUT points only)

When Mark IN/OUT points are created, the scene number and take number for them are fixed at 000 and 00, respectively.

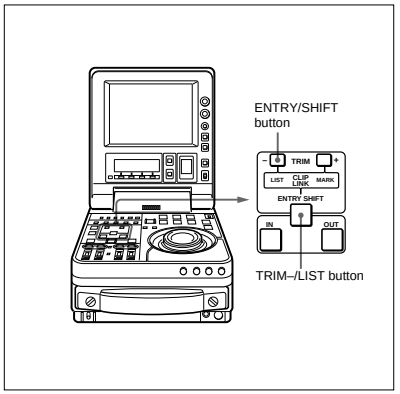
The above operations other than automatic creation of new ClipLink log data require the ClipLink log data list display.

Notes
- For a tape on which index pictures are already recorded, you cannot change any ClipLink log data other than the reel numbes and OK/NG status. (When index pictures are recorded on a tape, the ClipLink log data list for the tape shows an IP indication.)
- You cannot carry out ClipLink operation such as “Continue” on the DSR-1/1P or DSR-300/300P for a tape whose ClipLink log data has been modified on this unit.

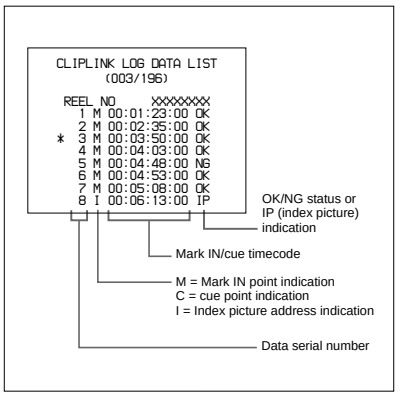
For an overview of the ClipLink function, refer to the separate ClipLink Guide.

Displaying ClipLink Log Data

To display ClipLink log data, hold down the ENTRY/SHIFT button and press the TRIM –/LIST button.



The following ClipLink log data list appears in the monitor.

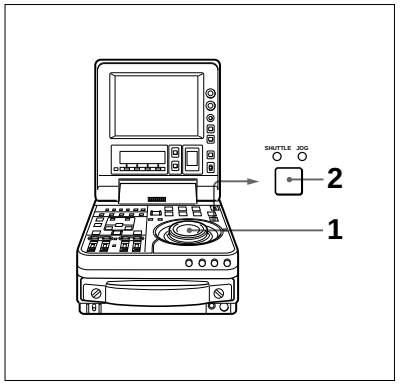

CLIPLINK LOG DATA LIST
(003/196)
REEL NO XXXXXXXX
1 M 00:01:23:00 OK
2 M 00:02:35:00 OK
* 3 M 00:03:50:00 OK
4 M 00:04:03:00 OK
5 M 00:04:48:00 NG
6 M 00:04:53:00 OK
7 M 00:05:08:00 OK
8 I 00:06:13:00 IP
OK/NG status or IP (index picture) indication
Mark IN/cue timecode
M = Mark IN point indication
C = cue point indication
I = Index picture address indication
Data serial number

To return to the original monitor display

To exit from the ClipLink log data list and return to the original monitor display, hold down the ENTRY/SHIFT button and press the TRIM–/LIST button.

Detailed Data Display

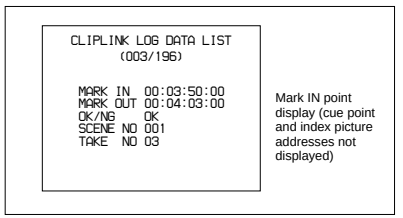
To check more details related to the data item selected on the ClipLink log data list, proceed as follows.



1 Using the shuttle/jog dial, move the selection mark (asterisk) to the data item for which you wish to display details.

2 Press the search button.

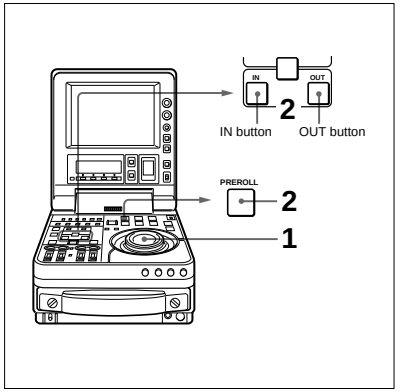
While you hold the search button down, the detailed data display appears.



Cuing Up to Mark IN/Cue Points

Cuing Up to Any Desired Position

To cue up to the point specified by the data item selected on the ClipLink log data list, proceed as follows.



1 Using the jog/shuttle dial, move the selection mark (asterisk) to the desired data item on the ClipLink log data list.

When the selected data item display contains "M" mark

The Mark IN point address is stored as the IN point and the Mark OUT point address is stored as the OUT point. At the same time, the IN button and the OUT button on the control panel light.

When the selected data item display contains "C" mark

The cue point address is stored as the IN point and the IN button on the control panel lights.

2 Operate as follows.

- **To cue up to the mark IN point or cue point**
  Holding down the IN button, press the PREROLL button.
- **To cue up to the mark OUT point**
  Holding down the OUT button, press the PREROLL button.

This exits from the ClipLink log data list and cues up to the selected position.

Cuing Up to Adjacent Mark IN/Cue Points

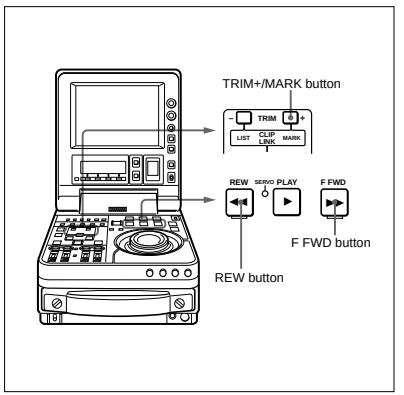
Once you select data on a ClipLink log data list, you can cue up to the point preceding or following the selected data with ease without reverting to the ClipLink log data list.

To cue up to the Mark IN point or cue point preceding the current point selected on the list

Holding down the TRIM+/MARK button, press the REW button.
During the cue-up operation is in progress, the REW button flashes.

To cue up to the Mark IN point or cue point following the current point selected on the list

Holding down the TRIM+/MARK button, press the F FWD button.
During the cue-up operation is in progress, the F FWD button flashes.

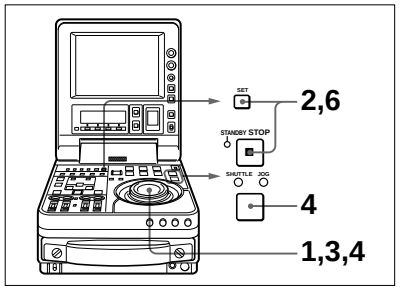


Rewriting ClipLink Log Data

You can rewrite the reel number, Mark IN/OUT points and OK/NG status included in the ClipLink log data.

Changing the Reel Number

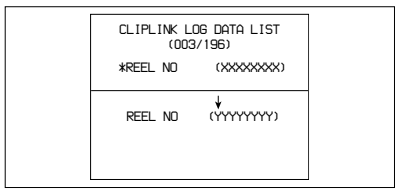
To change the reel number of the data item selected on the ClipLink log data list, proceed as follows.



1 Using the jog/shuttle dial, move the selection mark (asterisk) to the desired data item on the ClipLink log data list.

2 Hold down the STOP button and press the SET button.

The following setting screen appears.



3 Turn the jog/shuttle dial to select the digit to change.

Rotating the jog/shuttle dial clockwise moves the current digit position to the right, and counterclockwise moves it to the left.

4 Hold down the search button and turn the jog/shuttle dial to change the digit indicated by an arrow (μ).

5 Repeat steps **3** and **4** until the settings for all digits are complete.

6 When all digits have been set, hold down the ENTRY/SHIFT button and press the TRIM+/MARK button.

The reel number changes.

7 Hold down the STOP button and press the SET button.

This returns to the original ClipLink log data list.

Note

If you carry out step **7** skipping step **6**, the original ClipLink log data list appears again on the monitor and, in this case, the reel number is not rewritten.

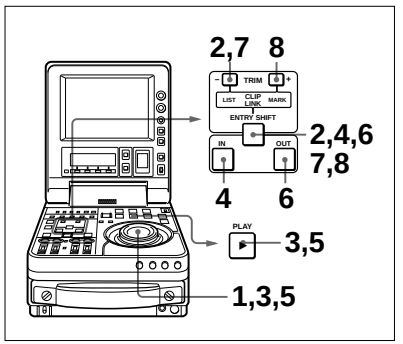
Changing Mark IN/OUT Points

To change Mark IN/OUT points selected on the ClipLink log data list, perform the following procedure.

When Mark IN/OUT points are rewritten to the cassette memory, the frame digits of the address data are processed as follows.

For Mark IN point: Any frame-digits value is counted as 1 second.

For Mark OUT point: Any frame-digits value is ignored.



1 Using the jog/shuttle dial, move the selection mark (asterisk) to the desired data item on the ClipLink log data list.

The Mark IN point address is stored as the IN point and the Mark OUT point address is stored as the OUT point. At the same time, IN button and the OUT button light.

2 Perform either one of the following operations.
- Hold down the ENTRY/SHIFT button and press the TRIM–/LIST button, exiting from the ClipLink log data list.
- Cue up to the IN point or OUT point. *(See page 93.)*

3 Cue up to the tape position to be made the new Mark IN point. *(See the section "Finding Edit Position — Search" on page 49.)*

4 Holding down the IN button, press the ENTRY/SHIFT button.

The ENTRY/SHIFT button lights and the Mark IN point address changes.

5 Cue up to the tape position to be made the new Mark OUT point. *(See page 49.)*

6 Holding down the OUT button, press the ENTRY/SHIFT button.

The Mark OUT point address changes.

7 Holding down the ENTRY/SHIFT button, press the TRIM–/LIST button to display the ClipLink log data list, then make sure the selection mark (asterisk) is kept at the position of the desired data item selected in step **1**.

If the selection mark (asterisk) is at a wrong position

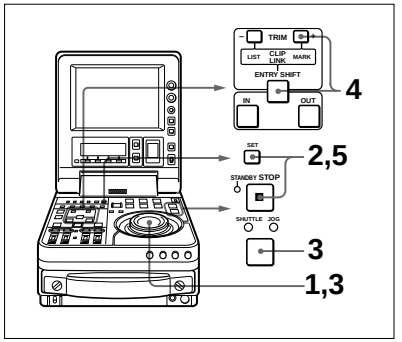
Using the jog/shuttle dial, return the selection mark to the desired data item.

8 Holding down the ENTRY/SHIFT button, press the TRIM+/MARK button.

The ENTRY/SHIFT button goes out and the Mark IN point and Mark OUT point addresses are rewritten.

Changing the OK/NG Status

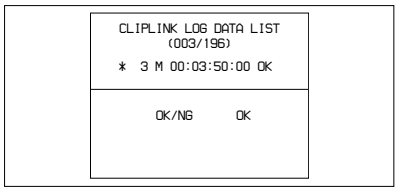
To change the OK/NG status of the data item selected on the ClipLink log data list, proceed as follows.



1 Using the jog/shuttle dial, move the selection mark (asterisk) to the desired data item on the ClipLink log data list.

2 Hold down the STOP button and press the SET button.

The following setting screen appears.



3 Hold down the search button and turn the jog/shuttle dial to change the setting to OK or NG as required.

4 Holding down the ENTRY/SHIFT button, press the TRIM+/MARK button.

The OK/NG status is rewritten.

(Continued)

Rewriting ClipLink Log Data

5 Hold down the STOP button and press the SET button.

This returns to the original ClipLink log data list.

Note

If you carry out step **5** skipping step **4**, the original ClipLink log data list appears again on the monitor and, in this case, the OK/NG status is not rewritten.

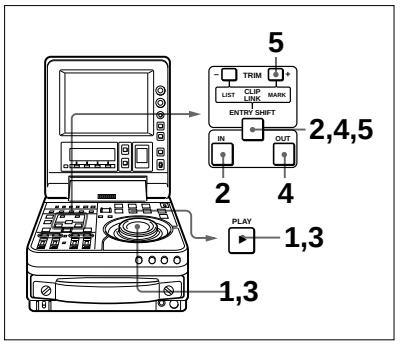
Adding to/Deleting From ClipLink Log Data

You can add new Mark IN/OUT point data to the ClipLink log data or delete Mark IN/OUT point data from the ClipLink log data.

Adding Mark IN/OUT Points

Set the setup menu item 129 (CLIPLINK) to ON beforehand, then proceed as follows.

For information about how to operate the setup menu, see Chapter 7 "Setup Menu" on page 101.



1 Cue up to the tape position you wish to make an additional Mark IN point. *(See page 49.)*

2 Holding down the IN button, press the ENTRY/SHIFT button.

The IN button and ENTRY/SHIFT button light, and the Mark IN point address is set.

3 Cue up to the tape position you wish to make an additional Mark OUT point. *(See page 49.)*

4 Holding down the OUT button, press the ENTRY/SHIFT button.

The OUT button lights, and the Mark OUT point address is set.

5 Holding down the ENTRY/SHIFT button, press the TRIM+/MARK button.

The ENTRY/SHIFT button goes out, and the Mark IN point and Mark OUT point data is added to the end of the existing ClipLink log data.

Note

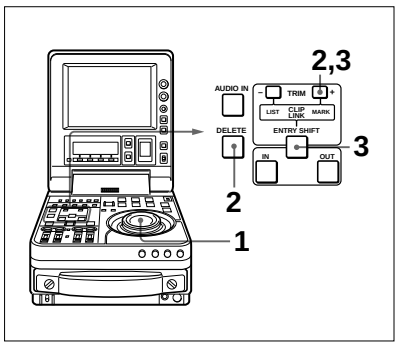
The volume of ClipLink log data that can be stored in a cassette memory depends on the cassette memory capacity as follows.

Cassette memory capacity	Storable volume of data
4K bits	45 pairs of Mark IN and Mark OUT points
16K bits	198 pairs of Mark IN and Mark OUT points

When adding to the existing ClipLink log data, carefully watch the ClipLink log data list not to allow the additional data to exceed the available cassette memory capacity.

Deleting Mark IN/OUT Points

After displaying the ClipLink log data, proceed as follows.



1 Using the jog/shuttle dialog, move the selection mark (asterisk) to the desired data item on the ClipLink log data list.

(Continued)

Adding to/Deleting From ClipLink Log Data

2 Holding down the DELETE button, press the TRIM+/MARK button.

The specified data disappears from the ClipLink log data list.

3 Holding down the ENTRY/SHIFT button, press the TRIM+/MARK button.

Note

If you exit from the ClipLink log data list skipping step **3**, the previous data is restored. The data specified for deletion is not deleted.

Automatically Creating New ClipLink Log Data

When the setup menu item 129 (CLIPLINK) is set to ON, you can automatically create new Mark IN/OUT points during recording or editing operation.

For information about how to operate the setup menu, see Chapter 7 "Setup Menu" on page 101.

New Mark IN/OUT points are created as follows.

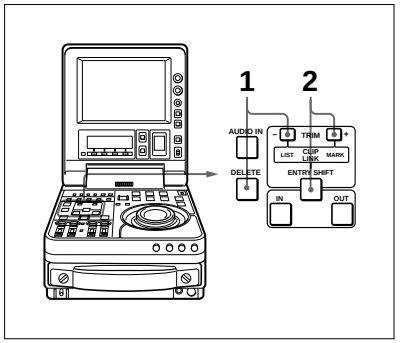
Operation	Automatic creation of Mark IN/OUT points
Recording	The recording starting point is made a Mark IN point and the recording ending point is made a Mark OUT point.
Editing	The edit IN point (the video IN point or audio IN point whichever coming first) is made a Mark IN point and the edit OUT point is made a Mark OUT point.

Notes

- If recording or editing is carried out when the setup menu item 130 (CLIPLINK) is set to OFF, the existing ClipLink log data is erased.
- If you carry out recording or editing on a tape on which index pictures are already recorded, the existing ClipLink log data for the tape is lost.
- The Mark IN/OUT point data automatically created during recording or editing operation for a tape on which no index pictures are recorded is added to the end of the existing ClipLink log data for the tape.
- If you carry out recording or editing on a tape position linked to the existing ClipLink log data, the link between them is lost. Therefore, when you start creating new ClipLink log data, where on the tape to start recording or editing must be determined very carefully. **If the existing ClipLink log data is no longer required, erase it beforehand.**

To erase ClipLink log data

After displaying the ClipLink log data list, proceed as follows.



1 Holding down the DELETE button, press the TRIM–/LIST button.

The data shown on the ClipLink log data list disappears.

2 Holding down the ENTRY/SHIFT button, press the TRIM+/MARK button.

The message "NO CLIPLINK LOG DATA" appears on the screen and the ClipLink log data is completely erased.

Chapter 7

Setup Menu

Menu System Configuration

The menu system of this unit comprises the basic menu and extended menu.

• **Basic menu**
This menu is used to make settings relating, for example, to the following.
– the digital hours meter
– the preroll time
– the character information superimposed on the output to the monitor

For detailed information about menu operation relating to the digital hours meter, see “Digital hours meter” (page 128).

• **Extended menu**
This menu is used to make a wide range of settings relating to the functions of this unit, for example, the control panel functions, video and audio control, and digital data processing.

Basic Menu

Items in the Basic Menu

The basic menu items (excluding the items related to the digital hours meter) are listed in the following table.

In the “Settings” column of the table, the factory default settings are underlined.

Basic Menu

Items in the basic menu

Item number	Item name	Settings
001	PREROLL TIME	**0S... 5S ...30S:** Set the preroll time to between 0 and 30 seconds in steps of 1 second. A preroll time of at least 5 seconds is recommended when using this unit for editing.
002 a)	CHARACTER H-POSITION	Adjust the horizontal screen position of the character information (as a hexadecimal value) which is superimposed on output from the VIDEO OUTPUT 2 (SUPER) connector and display on the LCD monitor. **00... 08 ...10 (DSR-70) /00... 09 ...12 (DSR-70P):** The hexadecimal value 00 is for the far left of the screen. Increasing the value moves the position of the characters to the right.
003 a)	CHARACTER V-POSITION	Adjust the vertical screen position of the first line of the character information (as a hexadecimal value) which is superimposed on output from the VIDEO OUTPUT 2 (SUPER) connector and display on the LCD monitor. **00... 15 ...1A (DSR-70)/00... 1A ...1E (DSR-70P):** The hexadecimal value 00 is for the top of the screen. Increasing the value lowers the position of the characters.
004	SYNCHRONIZE	When editing using this unit as a controller and an external VTR connected to this unit via a 9-pin remote control cable or i. LINK/DV cable, this item determines whether or not to operate the two units in phase synchronization. **ON:** Operate in phase synchronization. **OFF:** Do not operate in phase synchronization.
005	DISPLAY INFORMATION SELECT	Determine the kind of character information which is superimposed on output from the VIDEO OUTPUT 2 (SUPER) connector and display on the LCD monitor when the control panel CHARACTER switch is set to ON. **T&STA:** Time data and the units status. **T&UB:** Time data and user bit data. (When UB is selected with the COUNTER SELECT button, the user bit data and time data arranged in that order are displayed.) **T&CNT:** Time data and counter count. (When CNT is selected with the COUNTER SELECT button, the counter count and time data arranged in that order are displayed.) **TIME:** Timecode (LTC or VITC) only. **DATE:** Recording date and time.
006	LOCAL FUNCTION ENABLE	Determine which tape transport control buttons on the control panel are enabled when this unit is controlled from external equipment. **DIS:** All buttons and switches are disabled. **ST&EJ:** Only the STOP button and EJECT button are enabled. **ENA:** All buttons and switches except the RECORDER button and PLAYER button are enabled.
007	TAPE TIMER DISPLAY	Determine whether to display the counter in 12-hour mode or 24-hour mode. **+ –12H:** 12-hour mode **24H:** 24-hour mode
008	MONITORING SELECTION FOR VTR-TO-VTR EDIT	For editing with two DSR-70/70P units, determine whether the recorder unit is forced into E-E mode when the recorder PLAYER button is pressed to view the player playback signals on the LCD monitor on the recorder. **MANU:** Do not force the recorder into E-E mode. **AUTO:** Force the recorder into E-E mode.
009 a)	CHARACTER TYPE	Determine the type of character information (timecode, etc.) which is superimposed on output from the VIDEO OUTPUT 2 (SUPER) connector and displayed on the LCD monitor. **WHITE:** White letters on a black background. **BLACK:** Black letters on a white background. **W/OUT:** White letters with black outline. **B/OUT:** Black letters with white outline.

a) When setting items 002, 003, 009, and 011, watch the monitor screen, and adjust to the required state. *(Continued)*

Items in the basic menu (continued)

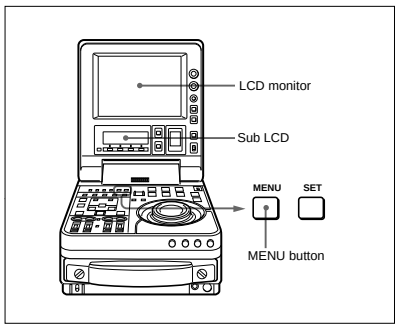
Item number	Item name	Item name
011 a)	CHARACTER V-SIZE	Determine the vertical size of character information (timecode, etc.) which is superimposed on output from the VIDEO OUTPUT 2 (SUPER) connector and displayed on the LCD monitor. ×**1**: Standard size ×**2**: 2 times standard size
014	SEQUENTIAL RECORD MODE	Select the mode for two-unit sequential recording. **OFF:** No sequential recording. **MANUAL CASSETTE REPLACE:** Do sequential recording one time. Exchange the cassettes when one sequential recording finishes. **AUTOMATIC OVERWRITE:** Do sequential recording, overlaying previously recorded contents. (Do not exchange cassettes.)
015 a)	MENU DISPLAY	Determine the type of characters in menu text superimposed on output from the VIDEO OUTPUT 2 (SUPER) connector and displayed on the LCD monitor. **WHITE:** White letters on a black background. **BLACK:** Black letters on a white background. **W/OUT:** White letters with black outline. **B/OUT:** Black letters with white outline.
016	ALARM	Select whether or not to display alarm messages. **OFF:** No alarm messages. **LIMIT:** Display alarm messages only during recording or editing. **ON:** Display alarm messages.
099	MENU GRADE	For setup menu operations, select whether to superimpose on output from the VIDEO OUTPUT 2 (SUPER) connector and display on the LCD monitor the basic menu information only or both the basic menu information and the extended menu information. **BASIC:** Display the basic menu information only. **ENHAN:** Display both the basic menu information and the extended menu information.

a) When setting items 002, 003, 009, 011 and 015, watch the monitor screen, and adjust to the required state.

Basic Menu Operations

This section describes the basic menu displays and how to change the settings.

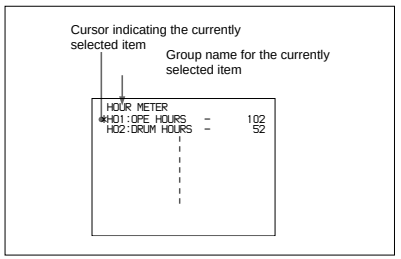
Displaying the menus



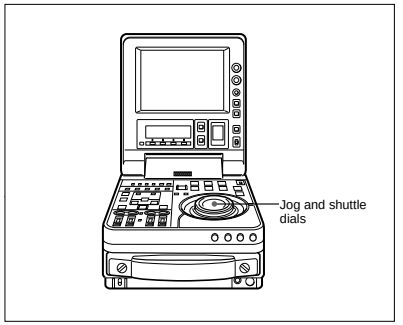
Press the MENU button.
The setting of the currently selected menu item appears in the LCD monitor and sub LCD.

Output from the VIDEO OUTPUT 2 (SUPER) connector

When the control panel CHARACTER switch is set to ON, the same menu screen also appears on a monitor connected to the VIDEO OUTPUT 2 (SUPER) connector as shown in the LCD monitor.


Cursor indicating the currently selected item
Group name for the currently selected item
HOUR METER
HO1:OPE HOURS - 102
HO2:DRUM HOURS - 52

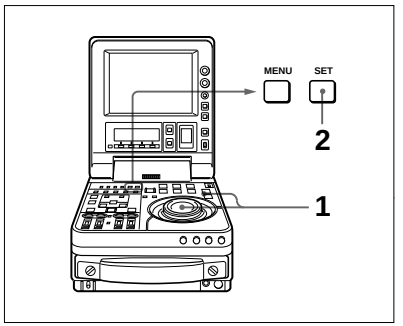
Changing the currently displayed menu item



Turn the jog or shuttle dial depending on the current search mode (indicated by JOG/SHUTTLE indicators). Turning the jog or shuttle dial in the clockwise direction increments the item number, and turning it in the counterclockwise direction decrements the item number.
If you turn the shuttle dial, the item number changes at a rate depending on the shuttle dial angle. If you turn the jog dial, the item number changes on the jog dial rotation speed.

Changing a menu item setting value

To change the setting value of the currently displayed menu item use the following procedure.



1 Holding down the search button, turn the jog or shuttle dial.

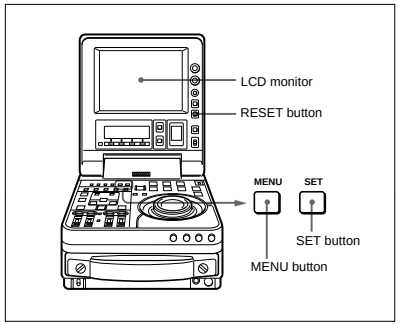
The setting value changes at a rate depending on the shuttle dial angle or on the jog dial rotation speed.

2 When the desired setting value is displayed, press the SET button.

This saves the new setting value, and the menu display disappears.

To abandon making a change
Press the MENU button before pressing the SET button.
The menu display disappears from the LCD monitor and sub LCD, without the new setting value being saved.

Resetting the menu settings to their factory default values



1 Set the MENU button.

The menu appears on the LCD monitor.

2 Press the RESET button.

3 Press the SET button.

The menu settings are reset to their factory default settings.

Extended Menu

Items in the Extended Menu

The extended menu contains the following items.
In the Settings column of the table, the factory default settings are underlined.

Menu items in the 100s, relating to the control panels

Item number	Item name	Settings
101	SELECTION FOR SEARCH DIAL ENABLE	Select how the unit enters the search mode. **DIAL:** Turning the jog or shuttle dial switches to search mode at all times except during recording/editing. **KEY:** The search button must be pressed to switch to search mode.
102	MAXIMUM TAPE SPEED	Specify the maximum tape speed in search mode. **× 85:** Maximum 85 times normal (picture invisible) **× 32:** Maximum 32 times normal **× 24:** Maximum 24 times normal **× 16:** Maximum 16 times normal
105	REFERENCE SYSTEM ALARM	Select whether or not to display alarm messages concerning the reference video signal. **ON:** Flash the STOP button and display an alarm message. **LIMIT:** Flash the STOP button and display an alarm message only either when the unit is in recording mode or E-E mode or when editing operation is being carried out. **OFF:** No alarm messages.
107	REC INHIBIT LAMP FLASHING	Select whether or not to flash the REC INHI indicator when recording is prevented though the REC INHI switch on the control panel is set to OFF. **OFF:** Light the REC INHI indicator. **ON:** Flash the REC INHI indicator.
108	AUTO EE SELECT	When a cassette is inserted and the PB/EE item in the sub LCD menu general settings page is set to PB/EE, select the operation modes in which input video and audio signals are automatically handled in E-E mode. **S/F/R:** In STOP/F FWD (fast-forward)/REW (rewind) modes **STOP:** In STOP mode
109	FORCED EE WHEN TAPE UNTHREAD	During tape threading and unthreading, and when no cassette is inserted, select whether the PB/EE item of the sub LCD menu general settings page controls the output signal PB/EE setting. **ON:** No control (the signal is always an E-E signal). **OFF:** Control.
118	KEY INHIBIT SWITCH EFFECTIVE AREA	Select which switches and buttons can be operated when the KEY INH in the sub LCD menu is set to ON. The following sub-items control different sets of switches and buttons independently.
	Sub-item	
	1 REMOTE SELECT	Select whether the REMOTE/LOCAL switch on the control panel is enabled. **DIS:** Disabled. **ENA:** Enabled.
	2 CONTROL PANEL	Select which switches and buttons operations on the control panel are enabled. **DIS:** All switches and buttons are disabled. **EDIT:** All switches and buttons for editing operations are disabled. **ENA:** All switches and buttons are enabled.

Menu items in the 100s, relating to the control panels (continued)

Item number	Item name	Settings
125	AUTO REW	Select whether to rewind the tape automatically when recording or playback reaches the end of a tape. **DIS:** Do not rewind the tape automatically. **ENA:** Rewind the tape automatically.
128	PAUSE FUNCTION	Select whether to use the search button as a pause button. **OFF:** Do not use as a pause button. **ON:** Use as a pause button.
129	CLIPLINK	Select whether to create ClipLink log data. **OFF:** Do not create. **ON**: Create. When recording, the recording starting point is made a Mark IN point and the recording ending point is made a Mark OUT point. When editing, the edit IN point (the video IN point or audio IN point whichever coming first) is made a Mark IN point and the edit OUT point is made a Mark OUT point. **Note** If recording or editing is carried out when this item is set to OFF, the existing ClipLink log data is erased.

Menu items in the 200s, relating to the remote control interface

Item number	Item name	Settings
201	PARA RUN	Select whether or not to use synchronized operation for two or more VTRs. **DIS:** No synchronized operation. **ENA:** Use synchronized operation. **Note** To use synchronized operation for two or more VTRs, set item 201 to ENA on all of the VTRs.

Menu items in the 300s, relating to editing operations

Item number	Item name	Settings
305	SYNC GRADE	When editing in phase-synchronized mode with item 004 set to ON, select the target phase synchronization accuracy. **ACCUR:** ±0 frame accuracy. **ROUGH:** ±1 frame accuracy.
307	AUTO-DELETION FOR INCONSISTENT DATA	Select what happens when an erroneous edit point is set. **MANU:** A warning is given by flashing the DELETE button on the control panel. The operator must manually delete the unnecessary edit point . **NEG&E:** When inconsistent edit points are set, such as when an OUT point is before an IN (or audio IN) point, or when too many edit points are specified, the previously set edit point is deleted. **NEG:** When inconsistent edit points are set, such as when an OUT point is before an IN (or audio IN) point, the previously set edit point is deleted. When too many edit points are specified, the DELETE button on the control panel flashes to give a warning. **Note** Pressing the button corresponding to an edit point to be deleted and the DELETE button simultaneously deletes the edit point. If an erroneous edit point is set (the DELETE button is flashing), editing is not executed.

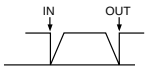
(Continued)

Chapter 7 Setup Menu

http://getMANUAL.com

Extended Menu

Menu items in the 300s, relating to editing operations (continued)

Item number	Item name	Settings
308	SELECTION OF STD/NON-STD FOR ANALOG VIDEO IN	Select the STD or NON-STD mode in accordance with a composite video or S-video input. **STD:** The STD mode is always used (forced STD mode). **N-STD:** Use this setting when the input video signal is unstable (forced NON-STD mode). When using a VCR with no built-in time base corrector (e.g. a home-use VHS-system VCR), select N-STD.
317	AUDIO EDIT MODE	Specify the type of editing for audio signals. **CUT:** Cut editing (discontinuity in audio signal may result at the editing point, causing noise.) **FADE:** Fade out and fade in 
318	EDIT RETRY	When editing with two DSR-70/70P units, set for the recorder. Selects the operation if the recorder was not synchronized in time. **OFF:** Editing is not carried out, and the unit stops. **ON:** The editing is automatically retried (up to twice).
327	AUDIO MODE CHANGE	Select whether to allow audio data recorded on tape in two-channel mode (or four-channel) to be re-recorded in four-channel (or two-channel mode). **OFF:** Do not allow re-recording in a different audio mode. **ON:** Allow re-recording in a different audio mode.

Menu items in the 400s, relating to preroll

Item number	Item name	Settings
401	FUNCTION MODE AFTER CUE-UP	Select the state that the unit goes into after a cuing-up operation. **STOP:** Stops (the STOP mode). **STILL:** Still playback (in search mode).
403	AUTOMATIC PREROLL REFERENCE ENTRY	Select whether or not the edit IN point is automatically set by pressing the PREROLL button when the IN point is not set before starting preroll. **DIS:** IN point is not set automatically. **ENA:** I N point is set automatically.

Menu items in the 500s, relating to tape protection

Item number	Item name	Settings
501	STILL TIMER	Select the time delay from the tape transport stopping (either the "STOP" mode" or the still playback mode in search mode) until the unit automatically switches to the tape protection mode, in order to protect the rotary heads and the tape. **0.5S... 8M ...30M:** Set the value in the range 0.5 seconds to 30 minutes.
502	TAPE PROTECTION MODE FROM SEARCH	Select the operation of the protection mode to protect the rotary heads and tape when in the still playback mode in search (jog/shuttle) mode. **STEP:** Step forward at $^{1}/_{30}$ normal speed every 2 seconds. **STDBY:** Switch to Standby OFF mode (the unit not on standby).

Menu items in the 600s, relating to the time code generator

Item number	Item name	Settings
605	TCG REGEN MODE	Select the signal to be regenerated when the time code generator is in the regeneration mode (i.e., when the PRESET/REGEN item in the sub LCD menu general settings page is set to REGEN, or the unit is in automatic edit mode). **TC&UB:** Both the timecode and user bits are regenerated. **TC:** Only the timecode is regenerated. **UB:** Only the user bits are regenerated.
607	U-BIT BINARY GROUP FLAG	Select the user bits to be used in the time code generated by the time code generator. **000:** Character set not specified. **001:** 8-bit characters compliant with ISO 646 and ISO 2022. **010:** Undefined. **011:** Undefined. **100:** Undefined. **101:** SMPTE 262M page/line multiplex system. **110:** Undefined. **111:** Undefined.
610	REGEN CONTROL MODE	When editing with two DSR-70/70P units, if you use the control panel for editing operation, select whether or not the timecode is automatically regenerated. **AS&IN:** In editing with this unit as the recorder, regardless of the settings of the TC INT/EXT switch and sub LCD menu item PRESET/REGEN, in assemble and insert editing , the timecode generator regenerates according to the timecode on the tape. **ASSEM:** In editing with this unit as the recorder, regardless of the settings of the TC INT/EXT switch and sub LCD menu item PRESET/REGEN, in assemble editing only, the timecode generator regenerates according to the timecode on the tape. **MANU:** Regardless of whether this unit is the recorder or player, the timecode generator operates in accordance with the settings of the TC INT/EXT switch and sub LCD menu item PRESET/REGEN. **FULL:** Regardless of the REMOTE/LOCAL switch setting, when any of the ASSEMBLE, VIDEO, AUDIO CH1,1/2, AUDIO CH2,3/4, and TC buttons is lit, the timecode generator regenerates according to the timecode played back from the tape.
611	TC OUTPUT PHASE IN EE MODE	Select the timecode output mode for output from the TC OUT connector in E-E mode. **MUTE:** Mute the output. **THRU:** Output the timecode input to the TC IN connector as it is. **V-IN:** Output the timecode with the same phase as the input video signal phase. **V-OUT:** Output the timecode with the same phase as the output video signal phase.
612	TC OUTPUT MUTE IN SEARCH MODE	Select whether to mute the output from the TC OUT connector in search (jog/shuttle) mode. **ON:** Mute. **OFF:** Do not mute.

Extended Menu

Menu items in the 700s, relating to video control

Item number	Item name	Settings
708	CHROMA PHASE ROTATION MODE	Select the phase rotation mode for chroma phase control. The effect of this setting applies to the output levels of all of the composite video, S video, SDI (when the DSBK-160 is installed) and component video (when the DSBK-170 is installed) signals. **U/V:** Select this setting when observing the unit's composite video output level using a composite vectorscope. **PB/PR:** Select this setting when observing the unit's component video output level using a component vectorscope.
713	VIDEO SETUP REFERENCE (DSR-70 only)	Select whether to remove the setup (7.5%) from the input analog video signals and whether to add the setup (7.5%) to the output analog video signals.
	Sub items	
	1 INPUT LEVEL	Whether to remove the setup from the input. **0.0%:** Do not remove. **7.5%:** Remove.
	2 OUT PUT LEVEL	Whether to add the setup to the output. **0.0%:** Do not add. **7.5%:** Add.
714	VIDEO ADJUST RANGE	Select the variable range of the VIDEO and CHROMA knobs when the PROCESS CONTROL in the sub LCD menu is set to PANEL. **–3~+3:** –3 dB to +3 dB **WIDE:** – ∞ to +3 dB

Items 715 to 718 : Settings for controlling the video processing system according to the menu settings.

Item number	Item name	Settings
715	VIDEO GAIN CONTROL	Adjust the video output level. **Default value:** 200H
716	CHROMA GAIN CONTROL	Adjust the chroma output level. **Default value:** 200H
717	CHROMA PHASE CONTROL	Adjust the chroma phase. **Default value:** 80H
718	SETUP LEVEL	Adjust the setup level (DSR-70)/black level (DSR-70P)). **Default value:** 200H

Note

When you make settings for items 715 to 718, set the PROCESS CONTROL in the sub LCD menu to SETUP. When set to SETUP, all controls on the front control panel are disabled.

Menu items in the 700s, relating to video control (continued)

Item number	Item name	Settings
729	CLOSED CAPTION BLANK (DSR-70 only)	Select whether to mute the closed caption signal to be superimposed on the 1st and 2nd fields of the output video signal.
	Sub items	
	1 FIELD 1	Select whether to mute the closed caption signal to be superimposed on the 1st field of the output video signal. **OFF:** Do not mute. **ON:** Mute.
	2 FIELD 2	Select whether to mute the closed caption signal to be superimposed on the 2nd field of the output video signal. **OFF:** Do not mute. **ON:** Mute.

Menu items in the 800s, relating to audio control

Item number	Item name	Settings
801	DIGITAL JOG SOUND	Select whether to adjust the audio playback speed during slow playback. **OFF:** Do not adjust the audio playback speed. **ON:** Adjust the audio playback speed.
811	AUDIO REFERENCE LEVEL	Select the audio reference level (headroom) for recording on tape. **–12dB** **–18dB (factory default for DSR-70P)** **–20dB (factory default for DSR-70)**
812	AUDIO OUTPUT LEVEL	Select the audio output reference level. **+4dB** **0dB** **–6dB**
813	PEAK HOLD TIME	Set the peak hold time for the audio level meter in the range of **OFF (no peak hold) to 1.5 seconds in 0.1 second steps.**
814	OVER RANGE DISPLAY HOLD	Select whether to hold the audio level meter OVER display. **OFF:** Do not hold. **ON:** Hold.

Menu items in the 900s, relating to digital process

Item number	Item name	Settings
912	SEQUENTIAL RECORD INPUT SIGNAL	Selects the signal input method for sequential recording on the recorder and player. **PARALLEL:** The video and audio signals you will record are input to the recorder and player separately. **CASCADE:** The video and audio signals you will record are input to the player, and input to the recorder as output signals from the player.

Extended Menu

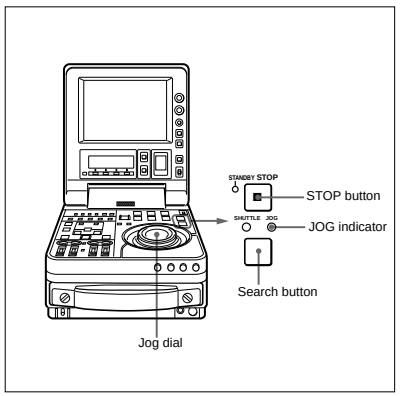
Extended Menu Operations

To use the extended menu, set basic menu item 999 MENU GRADE to ENHAN beforehand.

In the extended menu, you can carry out the same operations as in the basic menu except setting of sub-items.

To set sub-items

Operate as follows.



1 Confirm the JOG indicator lights. If not, set the unit to jog mode by pressing the jog dial.

2 Select the desired menu item.

For information about how to select a menu item, see the section "Changing the currently displayed menu item" (page 104).

3 Holding down the STOP button, turn the jog dial to select the desired sub-item.

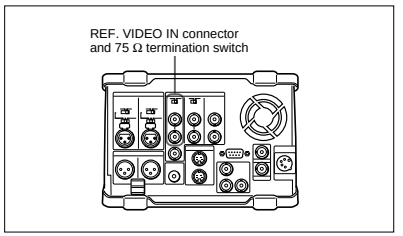
4 Holding down the search button, turn the jog dial to change the value for the selected sub-item.

Chapter 8

Connections and Settings

Reference Video Signals for Analog Signal Editing

In order to provide stable video and audio signals for analog editing, it is necessary for the built-in time base corrector (TBC) to operate correctly. To ensure this, input a reference video signal synchronized with the video signal to the REF. VIDEO IN connector and set the REF. VIDEO IN 75 Ω termination switch to ON.



Connections for Cut Editing Using i.LINK Interface (Optional DSBK-140 Required)

Using two DSR-70/70P units, each fitted with the optional DSBK-140 board, as a pair of player and recorder, you can configure a cut editing system.

For connections and settings, see the section "Connections for Cut Editing Using Two DSR-70/70P Units" on page 36.

Connections for Digital Nonlinear Editing Using SDTI (QSDI) Interface (Optional DSBK-150 Required)

This unit can be connected to an ES-7 EditStation to configure a digital non-linear editing system. Using the SDTI (QSDI) interface, you can transfer video, audio, timecode, and other compressed data between this unit and the ES-7.
The unit supports ClipLink functions, enabling index pictures recorded on tape and ClipLink log data stored in cassette memory to be transferred to the ES-7 in an instant.

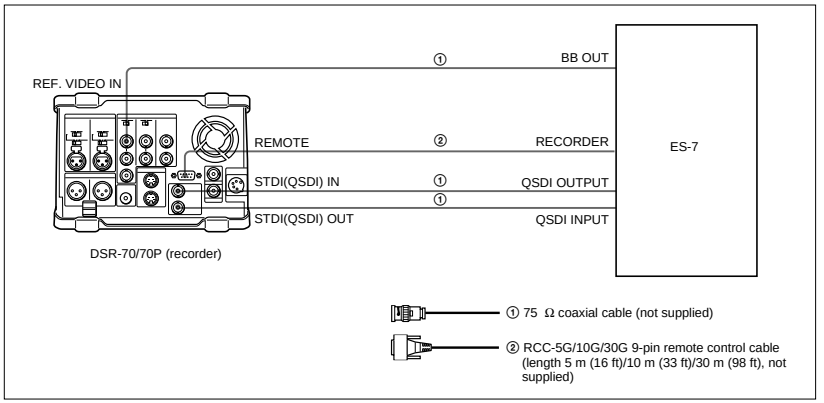
For an overview of the ClipLink function, refer to the separate ClipLink Guide.

The following is a connection diagram for digital non-linear editing system in which this unit serves as the recorder.

For connections of the ES-7's peripheral devices (the control panel, the disk unit, etc.) and the player, refer to your ES-7 Operating Instructions.

Note

In this case, the DSBK-150 SDTI (QSDI) Iuput/Output Board is required.


REF. VIDEO IN
REMOTE
STDI(QSDI) IN
STDI(QSDI) OUT
DSR-70/70P (recorder)
① BB OUT
② RECORDER
① QSDI OUTPUT
① QSDI INPUT
ES-7
① 75 Ω coaxial cable (not supplied)
② RCC-5G/10G/30G 9-pin remote control cable (length 5 m (16 ft)/10 m (33 ft)/30 m (98 ft), not supplied)

Settings on the DSR-70/70P

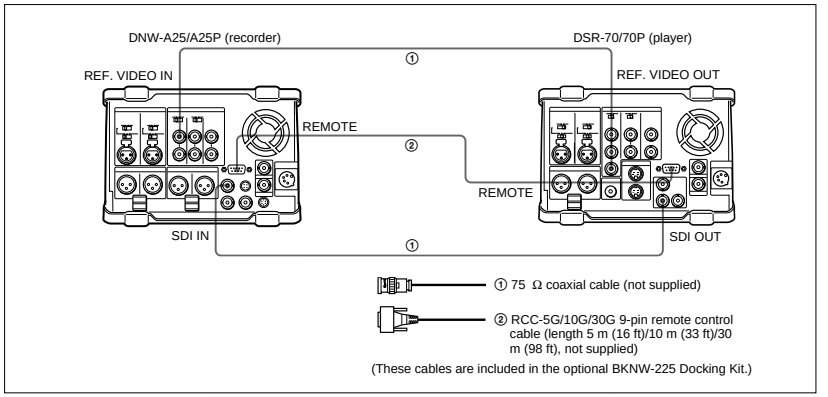
Switch	Setting
REMOTE/LOCAL	REMOTE
REF. VIDEO IN 75Ω termination	ON

Connections for Cut Editing Using SDI Interface (Optional DSBK-160 Required)

For a cut editing system using this unit together with a DNW-A25/A25P Betacam SX VCR using an SDI connection, the following figure shows an example of the connections. In this example, the DNW-A25/A25P is used as the recorder and this unit is used as the player.

Note

In this case, the DSBK-160 SDI Iuput/Output Board is required.



DNW-A25/A25P settings

Switch/menu	Setting
REMOTE/LOCAL	LOCAL
REF. VIDEO IN 75 Ω termination switch	OFF

DSR-70/70P settings

Switch	Setting
REMOTE/LOCAL	REMOTE

Settings Required When Connecting an External Editing Control Unit

When connecting an external editing control unit to this unit and using this unit as a recorder, make the following timecode settings on this unit and VCR constant and DIP switch settings on the editing control unit.

Timecode Settings on This Unit

Make the following timecode settings for this unit.

Switch/sub LCD menu	Setting
TC INT/EXT switch	INT
Sub LCD menu PRESET/REGEN item (General settings page (1))	PRESET
Sub LCD menu F-RUN/R-RUN item (General settings page (1))	F-RUN

Settings Required When Connecting an External Editing Control Unit

Settings on Editing Control Units

Make the following settings according to the editor model.

For FXE-100/120 (NTSC)

Set the VCR constants as follows.

Byte No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Setting	80	13	00	96	05	05	03	80	0A	08	FE	00	80	5A	FF

For FXE-100P/120P (PAL)

Set the VCR constants as follows.

Byte No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Setting	81	13	00	7D	05	05	02	80	0A	07	FE	00	80	4C	FF

For BVE-910/2000

Set the VCR constants as follows.
• When using the DSR-70 (NTSC)

Byte No.	Block 1								Block 2						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Setting	80	13	00	96	05	05	03	80	0A	08	FE	00	80	5A	FF

• When using the DSR-70P (PAL)

Byte No.	Block 1								Block 2						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Setting	81	13	00	7D	05	05	02	80	0A	07	FE	00	80	4C	FF

For RM-450 (NTSC)

Set the VCR constants as follows.
• Left DIP switch

Switch No.	7	6	5	4	3	2	1	0
Setting	OFF	—	—	OFF	—	—	—	—

• Right DIP switch

Switch No.	7	6	5	4	3	2	1	0
Setting	OFF	—	OFF	ON	OFF	OFF	ON	ON

For RM-450CE (PAL)

Set the VCR constants as follows.
• Left DIP switch

Switch No.	7	6	5	4	3	2	1	0
Setting	OFF	—	—	OFF	—	—	—	—

• Right DIP switch

Switch No.	7	6	5	4	3	2	1	0
Setting	ON	—	OFF	ON	OFF	OFF	ON	ON

For BVE-800

Set the VCR constants as follows.

When using the DSR-70 (NTSC)
• SW2

Switch No.	1	2	3	4	5	6	7	8
Setting	ON	OFF	ON	ON	—	ON	ON	—

• SW3

Switch No.	1	2	3	4	5	6	7	8
Setting	OFF	ON	OFF	ON	—	ON	OFF	OFF

When using the DSR-70P (PAL)
• SW2

Switch No.	1	2	3	4	5	6	7	8
Setting	ON	OFF	ON	ON	—	ON	ON	—

• SW3

Switch No.	1	2	3	4	5	6	7	8
Setting	ON	ON	OFF	ON	—	ON	OFF	OFF

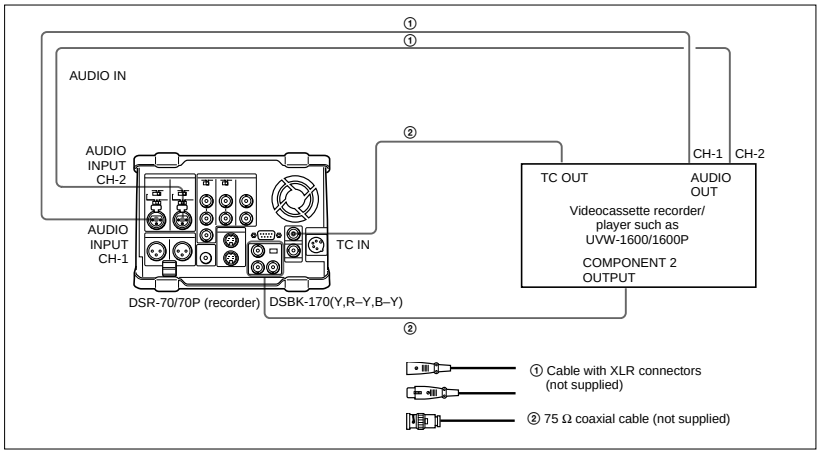
For PVE-500

Use the factory settings as they are.

Connections for Component Analog Recording (Optional DSBK-170 Required)

The following shows connections for a system in which analog playback signals from another recorder or player are recorded on the DSR-70/70P. In this system, the video signals are analog component signals and the audio signals are recorded from audio channels 1 and 2.

Note
In this case, the DSBK-170 Analog Component Iuput/ Output Board is required.



Settings on the DSR-70/70P

Switch	Setting
AUDIO INPUT CH-1/ CH-2 level adjustment knobs	Normally +4 dBu
REMOTE/LOCAL	LOCAL (When controlling the unit from an editing controller, set to REMOTE.)
IN/OUT (on the DSBK-170)	IN

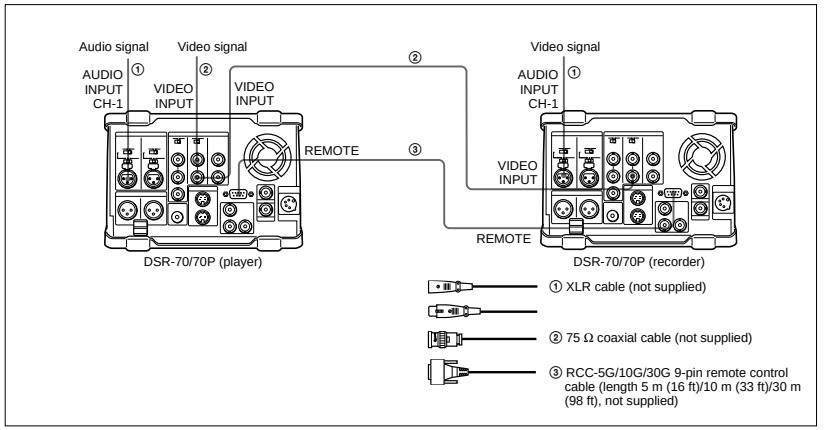
Connections for Sequential Recording Using Two Units

The following shows connections for sequential recording using two DSR-70/70P units. You can carry out two-unit sequential recording by inputting analog composite video signals and analog audio signals in the following two ways.

In the following, the controlling unit is referred to as the recorder and the controlled unit as the player.

For information about how to carry out two-unit sequential recording, see the section "Sequential Recording Using Two Units" on page 80.

Connections for sequential recording made by inputting external video and audio signals to both the player and recorder



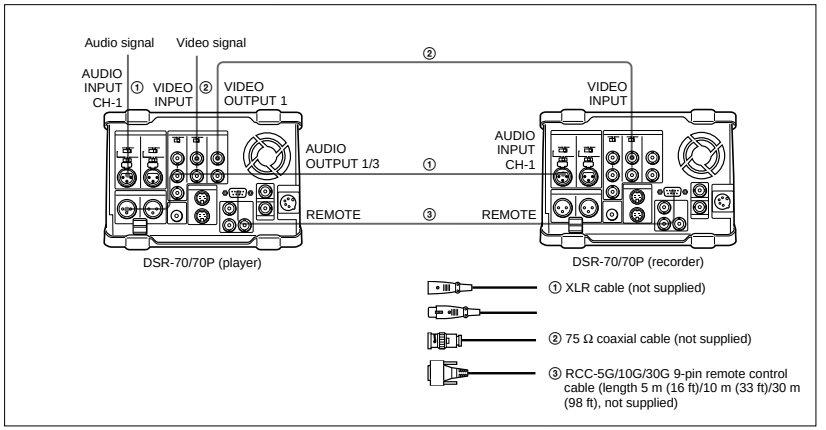
Player settings

Switch/menu	Setting
REMOTE/LOCAL switch	REMOTE
VIDEO INPUT 75 Ω termination switch	OFF

Recorder settings

Switch/menu	Setting
REMOTE/LOCAL switch	LOCAL
VIDEO INPUT 75 Ω termination switch	ON
Setup menu item 014	Other than OFF
Setup menu item 912	PARALLEL

Connections for sequential recording made by inputting external video and audio signals to the player and inputting the video and audio signals output from the player to the recorder



Player settings

Switch/menu	Setting
REMOTE/LOCAL switch	REMOTE
VIDEO INPUT 75 Ω termination switch	ON

Recorder settings

Switch/menu	Setting
REMOTE/LOCAL switch	LOCAL
VIDEO INPUT 75 Ω termination switch	ON
Setup menu item 014	Other than OFF
Setup menu item 912	CASCADE

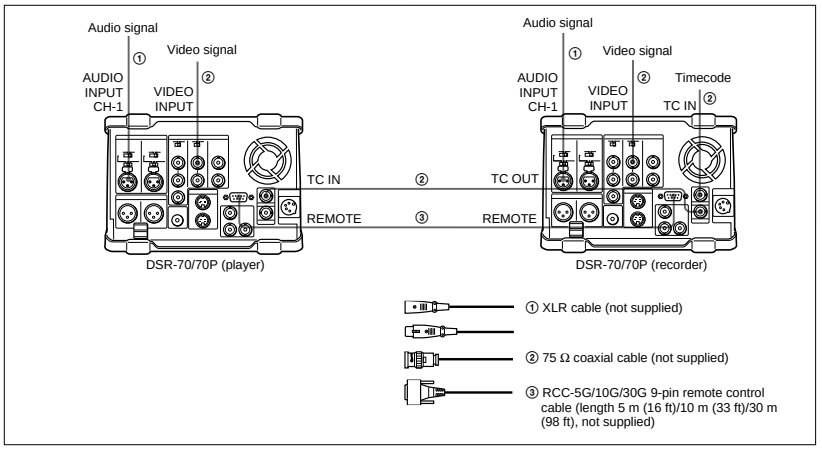
Connections for Parallel Recording Using Two Units

The following shows connections for parallel recording using two DSR-70/70P units.
In the following, the controlling unit is referred to as the recorder and the controlled unit as the player.

For information about how to carry out two-unit parallel recording, see the section "Parallel Recording Using Two Units" on page 81.

The connections and settings to be made differ depending on the timecode to be used, as follows.

Inputting an external timecode to both the player and recorder



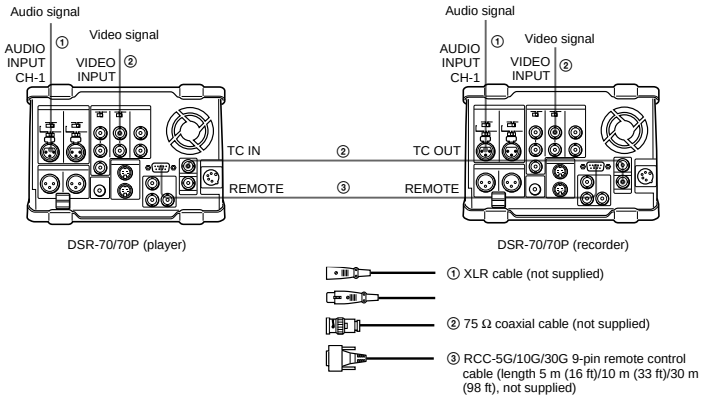
Player settings

Switch/menu	Setting
REMOTE/LOCAL switch	REMOTE
VIDEO INPUT 75 Ω termination switch	ON
TC INT/EXT switch	EXT
Sub LCD menu item PRESET/REGEN	REGEN
Setup menu item 201	ENA

Recorder settings

Switch/menu	Setting
REMOTE/LOCAL switch	LOCAL
VIDEO INPUT 75 Ω termination switch	ON
TC INT/EXT switch	EXT
Sub LCD menu item PRESET/REGEN	REGEN
Setup menu item 201	ENA
Setup menu item 611	THRU

Inputting the timecode generated by the recorder to the player



Player settings

Switch/menu	Setting
REMOTE/LOCAL switch	REMOTE
VIDEO INPUT 75 Ω termination switch	ON
TC INT/EXT switch	EXT
Sub LCD menu item PRESET/REGEN	REGEN
Setup menu item 201	ENA

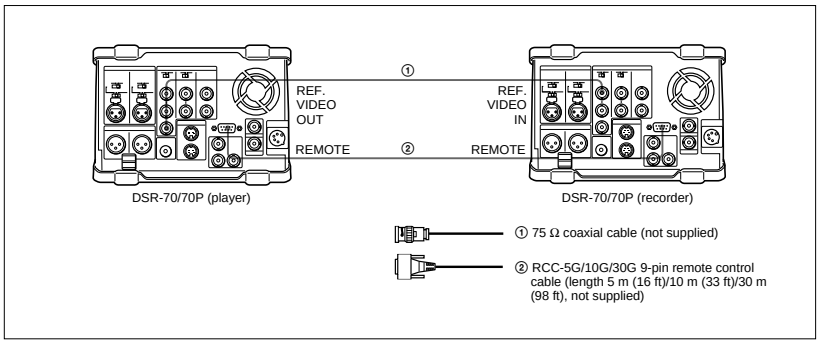
Recorder settings

Switch/menu	Setting
REMOTE/LOCAL switch	LOCAL
VIDEO INPUT 75 Ω termination switch	ON
TC INT/EXT switch	INT
Sub LCD menu item PRESET/REGEN	PRESET
Setup menu item 201	ENA
Setup menu item 611	V-IN

Connections for Two-Unit Synchronous Playback

The following shows connections for synchronous playback using two DSR-70/70P units.
In the following, the controlling unit is referred to as the recorder and the controlled unit as the player.

For information about how to carry out two-unit synchronous playback, see the section "Two-Unit Synchronous Playback" on page 89.


REF. VIDEO OUT
REMOTE
REF. VIDEO IN
REMOTE
①
②
DSR-70/70P (player)
DSR-70/70P (recorder)
① 75 Ω coaxial cable (not supplied)
② RCC-5G/10G/30G 9-pin remote control cable (length 5 m (16 ft)/10 m (33 ft)/30 m (98 ft), not supplied)

Player settings

Switch/menu	Setting
REMOTE/LOCAL switch	REMOTE

Recorder settings

Switch/menu	Setting
REMOTE/LOCAL switch	LOCAL
Setup menu item 004	ON (Synchronize.) OFF (Do not synchronize.)
Setup menu item 305 (When synchronizing, synchronization accuracy)	ACCUR (±0 frame) ROUGH (±1 frame)
REF. VIDEO IN 75 Ω termination switch	ON

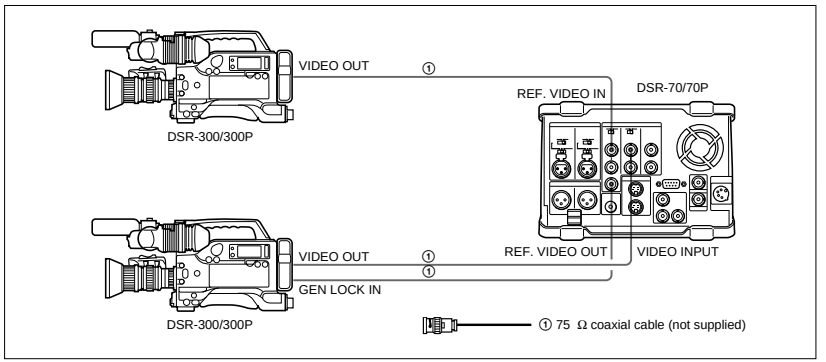
Connections for Two-Input Switched Video Recording (Optional DSBK-180/180P Required)

You can use the DSR-70/70P in combination with two DSR-300/300P or other camcorders, for two-input switched video recording.
The following figure shows the connections in this case.

Note

In this case, the DSBK-180/180P Dual Video Iuput Board is required.

For information about how to carry out two-input switched video recording, see page 82.



Notes

- The video signals output from the two camcorders must be synchronous. Make sure at least one of the two camcorders used has the Gen-lock (generator lock) function.
- When using a camcorder without the Gen-lock function, connect its output video to the REF. VIDEO IN connector of this unit.
- When long cables are used to connect two camcorders to this unit, a slight shift in phase between the video signals input from them may result.

For information about how to make phase adjustment in such a case, see the section "To adjust the output video signal phases" on page 83.

DSR-70 settings

Switch	Setting
REF. VIDEO IN 75 Ω termination switch	ON
VIDEO INPUT 75 Ω termination switch	ON

Connections for Digitally Dubbing Signals in DVCAM Format (Optional DSBK-140 or DSBK-150 Required)

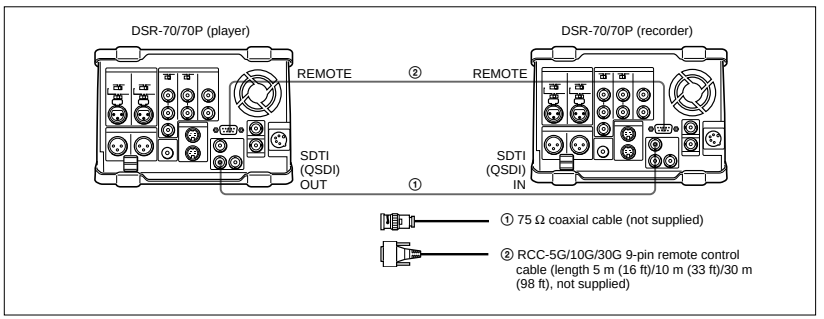
You can use this unit to digitally dub signals in DVCAM format automatically from the beginning of the tape to the end, through an i.LINK or SDTI(QSDI) interface.

For information about how to carry out digital dubbing, see the section "Digitally Dubbing Signals in DVCAM Format" on page 85.

Connecting two DSR-70/70P units using the i.LINK interface (DSBK-140 i.LINK/DV Input/ Output Board)

Make the same connections and settings as described in the section "Connections for Cut Editing Using Two DSR-70/70P Units" on page 36.

Connecting two DSR-70/70P units using the SDTI(QSDI) interface (DSBK-150 SDTI (QSDI) Input/ Output Board)


DSR-70/70P (player)
DSR-70/70P (recorder)
REMOTE
②
REMOTE
SDTI (QSDI) OUT
SDTI (QSDI) IN
①
① 75 Ω coaxial cable (not supplied)
② RCC-5G/10G/30G 9-pin remote control cable (length 5 m (16 ft)/10 m (33 ft)/30 m (98 ft), not supplied)

Player settings

Switch	Setting
REMOTE/LOCAL switch	REMOTE

Recorder settings

Switch	Setting
REMOTE/LOCAL switch	LOCAL

When connecting this unit with a DSR-60/60P/ 80/80P/85/85P unit using the SDTI(QSDI) interface (DSBK-150)

Replace the DSR-70/70P (player) shown in the above diagram with a DSR-60/60P/80/80P/85/85P unit and make the same connections as shown above.
The SDTI(QSDI) interface connector of the DSR-60/ 60P/80/80P/85/85P is marked "QSDI(OUTPUT)".

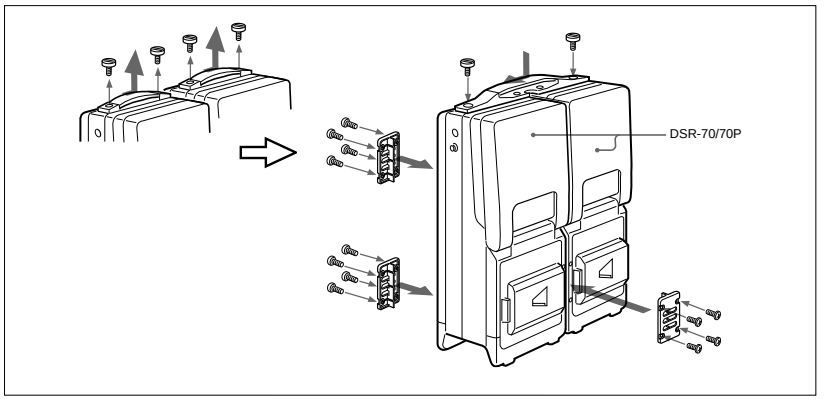
Combining Two VCRs

The following figure shows how to combine two VCRs using the optional BKNW-225 Docking Kit.

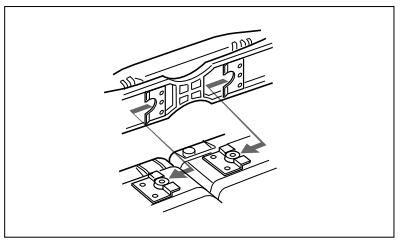
For more information, refer to the operation guide for the BKNW-225.

Caution

If you combine two units or separate the combined units incorrectly, the units may fall down and cause body injury.
Follow the procedures described below for separation or combination.



How to attach handle



Attaching the fixing plates

If you want to be able to combine two units or separate the combined units without using tools such as screwdrivers, replace the screws (M3) that hold the fixing place in place with the supplied coin screws.

Note

The coin screws (M4) for fixing the handle have washers. When you remove the handle, keep the screws and washers by fastening them to the handle.

To separate the combined VCRs

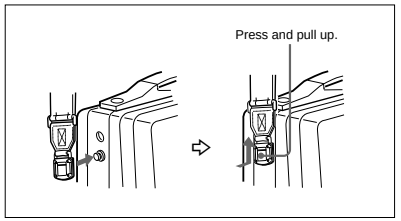
Reverse the steps for combination in a horizontal position.

Using the Shoulder Belt

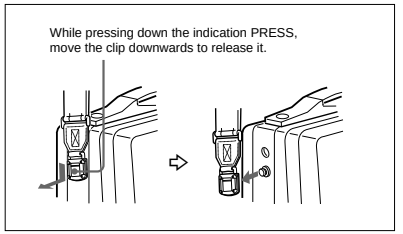
The following figures show how to fit the supplied shoulder belt.

Caution

If you fit the shoulder belt incorrectly, the unit may fall down and cause body injury. Follow the procedures described below to fit or remove the shoulder belt.



To remove the shoulder belt



Chapter 9

Maintenance and Troubleshooting

Condensation

If you move the unit suddenly from a cold to warm location, or if you use it in a very humid place, moisture from the air may condense on the head drum. This is called condensation, and if a tape is run in this state, the tape may stick to the drum and can be easily damaged. To lessen the risk of this occurring, this unit is equipped with a condensation detection system.

If condensation occurs while the unit is operating:

The alarm message “MOISTURE HAS BEEN DETECTED.” appears on the monitor screen, and the alarm message “HUMID!” in the sub LCD. At the same time the unit ejects the cassette automatically. If this happens, leave the unit’s power on and wait until the alarm messages disappear.

If the condensation alarm messages appear immediately after powering on:

Leave the unit powered on and wait until the alarm messages disappear. You cannot load a cassette into the unit while the alarm messages are being displayed Once the alarm messages disappear, the unit is ready for use.

Head Cleaning

Always use the DVM12CL (mini-size) or DV12CL (standard size) Cleaning Cassette to clean the video and audio heads. You can run the cleaning cassette for 10 seconds per cleaning operation. Follow the instructions for the cleaning cassette, as inappropriate use of the cleaning cassette can damage the heads.

To clean the heads

Insert the cleaning cassette. This automatically starts cleaning. You cannot operate any tape transport control buttons other than the EJECT button during the cleaning operation.

After about 10 seconds, the cleaning cassette will be automatically ejected.

http://getMANUAL.com

Periodic Maintenance

Digital hours meter

The digital hours meter can display seven items of information in the sub LCD, in corresponding display modes, about the operational history of the unit. Use it as a guide in scheduling periodic maintenance.

For periodic maintenance, cousult your Sony dearler.

Display modes of the digital hours meter

H01: OPERATION mode
Displays the total number of hours the unit has been powered on in units of 1 hour.

H02: DRUM RUNNING mode
Displays the total number of hours the drum has run with tape threaded in units of 1 hour.

H03: TAPE RUNNING mode
Displays the total number of hours the unit has been in fast forward, rewind, playback, search, recording or editing (except for stop and still) mode in units of 1 hour.

H04: THREADING mode
Display the total number of times tape has been threaded in the unit.

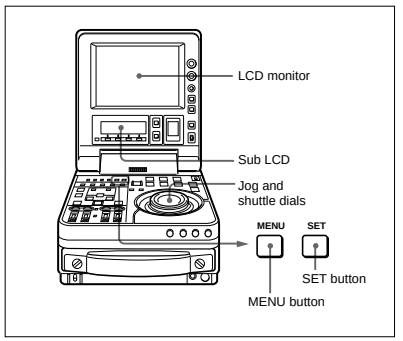
H12: DRUM RUNNING mode (resettable)
Same as H02 except that the count is resettable. This can be used as a guide in determining when to replace the drum.

H13: TAPE RUNNING mode (resettable)
Same as H03 except that the count is resettable. This can be used as a guide in determining when to replace such components as stationary heads and pinch roller.

H14: THREADING mode (resettable)
Same as H04 except that the count is resettable. This can be used as a guide in determining when to replace, for example, the threading motor.

To display the hours meter

Press the MENU button, then turn the jog or shuttle dial to display the required item in the LCD monitor and sub LCD.



To exit from the hours meter

Press the MENU button or SET button.

Troubleshooting

If an alarm message appears on the monitor (this unit's LCD monitor or the video monitor connected to this unit) or in the sub LCD, or if the unit appears to be malfunctioning, please check the following before contacting your Sony dealer.

Tape problems		
Symptom	**Cause**	**Remedy**
Recording is not possible.	The cassette's REC/SAVE switch is set to SAVE.[a)]	Set the REC/SAVE switch to REC.
The unit's tape transport control buttons (PLAY, F FWD, REW, etc.) do not work.	The REMOTE/LOCAL switch is set to REMOTE and stepup menu item 006 (LOCAL FUNCTION ENABEL) is set to ST&EJ or DIS.[a)]	Set the REMOTE/LOCAL switch to LOCAL and setup menu item 006 to ENA.
	No cassette is loaded.[a)]	Insert a cassette.
The NO EDIT indication appears in the sub LCD.	The recording mode selected on this unit does not coincides with that of the loaded tape.[a)]	• Set the unit for the same recording mode as with the tape. • When your current purpose is recording, you can use the tape currently loaded in the unit.
	The recording format of the currently loaded tape is "DV".[a)]	• If you are using the unit for recording, you can use the currently loaded tape. • You can use the currently loaded tape as a source tape for playback and editing. • You cannot use the tape as a recording tape for editing.

Time data problems		
Symptom	**Cause**	**Remedy**
Cannot freely set the time data's initial value.	The TC INT/EXT switch is set to EXT[a)].	Set the TC INT/EXT switch to INT.
	Sub LCD menu item PRESET/REGEN is set to REGEN.	Set the sub LCD menu item PRESET/REGEN to PRESET.
	CNT is selected as the time data type to be displayed. (The time data indication CNT is displayed in tha sub LCD.)[a)]	Press the COUNTER SELECT button to display the time data indication TC or UB.
	The REMOTE/LOCAL switch is set to REMOTE and setup menu item 006 (LOCAL FUNCTION ENABLE) is set to ST&EJ or DIS.[a)]	Set the REMOTE/LOCAL switch to LOCAL and setup menu item 006 to ENA.
The tape is running, but the time data indication is not shown in the sub LCD.	The HOLD button on the display panel has been pressed.	Press the button once again to exit the time code preset mode.
	The time data indication UB is displayed in the sub LCD.	Press the COUNTER SELECT button to display the time data indication CNT or TC.

Input problems		
Symptom	**Cause**	**Remedy**
It is not possible to record an SDTI signal.	No SDTI signal is input to the unit.[a)]	Connect an SDTI (QSDI) signal to the SDTI (QSDI) IN connector.

a) In these states, alarm messages appear on the monitor screen and in the sub LCD.

Troubleshooting

Monitor problems		
Symptom	**Cause**	**Remedy**
Data is not superimposed on the monitor screen.	The CHARACTER switch is set to OFF.	Set the CHARACTER switch to ON.
	The monitor is not connected to the VIDEO OUTPUT 2 (SUPER) connector of this unit.	Connect the monitor to the VIDEO OUTPUT 2 (SUPER) connector. (You must make this connection to display any type of text on the monitor.)
The image on the monitor's screen is too bright.	The 75 Ω termination switch for video input on the monitor is in the OFF position or a 75 Ω terminator is not fitted to its video input connector.	Set the 75 Ω termination switch to ON or connect a terminator.
The image on the monitor's screen is too dark.	In a video signal loop-through connection of video monitors, 75 Ω termination switches for video input on monitors other than the loop-end monitor are in the ON position.	Set the 75 Ω termination switches to OFF on all monitors other than the loop-end monitor .
The image is too dark when recording a composite video signal.		

Audio problems		
Symptom	**Cause**	**Remedy**
The AUDIO INPUT level adjustment knobs do not work.	The AUDIO INPUT PRESET/VARIABLE switch is set to PRESET.	Set the AUDIO INPUT PRESET/VARIABLE switch to VARIABLE.
Sliding the PB AUDIO level adjustment sliders does not change the playback audio output level.	PB AUDIO PRESET/VARIABLE switch is set to PRESET.	Set the PB AUDIO PRESET/VARIABLE switch to VARIABLE.

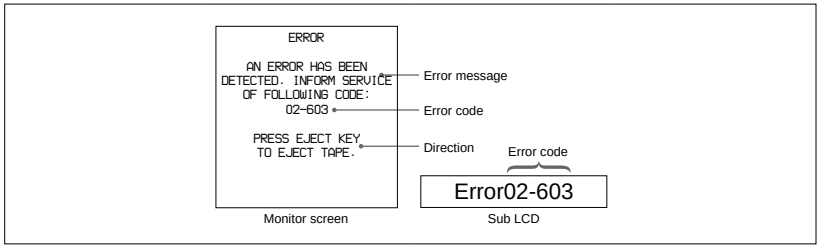
Editing problems		
Symptom	**Cause**	**Remedy**
Execution of video editing in insert mode causes subcode data recorded on tape other than time code data to disappear from tape.	This phenomenon cannot be avoided with an editing system using this unit as the recorder.	

Error Messages

This unit is provided with a self-diagnostic function that detects internal abnormalities. When it detects an abnormality, it outputs an error message to the monitor screen and indicates an error code in the sub LCD.

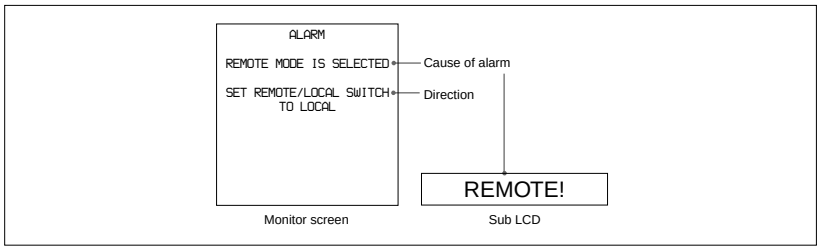
Note

To display error messages on the monitor screen, set the CHARACTER switch to ON.



Alarm Messages

When a setting, connection or operation error has been made, or when a problem such as condensation on heads has occurred, the unit outputs alarm messages such as the ones shown below to the monitor screen and the sub LCD.



If an alarm message appears, follow the direction indicated under the message on the monitor screen.

To display alarm messages on the monitor screen, set the CHARACTER switch to ON, and setup menu item 016 (ALARM) and 106 (REFERENCE SYSTEM ALARM) to ON or LIMIT.

Troubleshooting

List of alarm messages and associated directions

Here is a list of alarm messages and associated directions to appear on the monitor screen. It also shows the corresponding alarm messages to appear on the sub LCD of this unit.

In this list the “Causes” of alarm are arranged in alphabetic order of the first word of their phrases.

Alarm messages and associated directions

Alarm message on monitor screen / Cause	Direction	Alarm message on sub LCD
A cleaning tape has been inserted.	The tape will automatically be ejected after cleaning is completed.	Cleaning Tp
A non-standard ref. signal is being used for REF. VIDEO.	Use a standard signal.	REF NON-STD
Abnormal settings selected in setup menu.	Correct the setup menu settings. Contact your Sony dealer if this alarm message appears again after making corrections.	ILL. SETUP
Audio not editable on this tape.	Use a tape recorded in 2-channel (48 kHz) or 4-channel (32 kHz) mode.	2CH/32kHz!
		Fs 44.1kHz!
	Use a tape having audio signals recorded in locked mode.	UNLOCK mode
Audio REC mode selection different from audio on tape.	Select the same audio recording mode as that of the tape.	A mode err
Audio REC (recording) mode cannot be changed during recording.	—	REC mode!
Counter mode is selected.	Use the COUNTER SELECT button to display the time data indication TC or UB in the sub LCD.	CNT mode!
Input selection cannot be changed in REC (recording) mode.	—	REC mode!
Input signal does not conform to DVCAM/DV format.	—	Unknown Sig
Input signal is 625/50.	—	625/50 sig!
Input signal is 525/60.	—	525/60 sig!
Input video is not detected.	Check the input video signal indication in the sub LCD and supply an appropriate video signal.	No INPUT!
Moisture has been detected.	Keep the power on and wait until this alarm message disappears.	HUMID!
No cassette in VTR.	Load a cassette.	No Cass.!
Record inhibit plug on the cassette is set to inhibit.	Set the REC/SAVE switch on the cassette to REC.	REC INHI.!
Remote mode is selected.	Set the REMOTE/LOCAL switch to LOCAL.	REMOTE!

(Continued)

Alarm messages and associated directions (Continued)

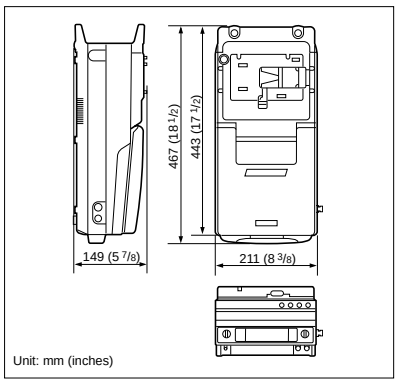
Alarm message on monitor screen / Cause	Direction	Alarm message on sub LCD
Tape cannot be replayed.	Use a tape having signals recorded in 525/60 format.	625/50 Tape
	Use a tape having signals recorded in 625/50 format.	525/60 Tape
Tape end has been detected.	Use a new cleaning tape.	Tape end!
Tape not editable.	Use a tape recorded in DVCAM format.	Not DVCAM!
	Use a tape having signals recorded in 525/60 format.	625/50 Tape
	Use a tape having signals recorded in 625/50 format.	525/60 Tape
Tape not usable.	Use DVCAM/DV ME (metal-evaporated) tape.	MP Tape!
		ILL. Tape!
TC EXTERNAL is selected.	Set the TC INT/EXT switch to INT.	TC EXT!
TCG REGEN mode is selected.	Set the sub LCD menu item PRESET/REGEN to PRESET.	REGEN mode!
TCG RUN mode is set to REC RUN.	Set the sub LCD menu item F-RUN/R-RUN to F-RUN.	REC RUN!

Appendixes

Specifications

General

Power requirements
12 V DC
Power consumption
46W (with no optional boards installed)
DSBK-140: 2.2W
DSBK-150: 3W
DSBK-160: 4W
DSBK-170: 0W
DSBK-180: 5W
Operating temperature
0˚C to 40˚C (32˚F to 104˚F)
Storage temperature
–20˚C to +60˚C (–4˚F to +140˚F)
Humidity Less than 80% (Operating)
Less than 90% (Storage)
Mass 5.8 kg (12 lb 12 oz)
Dimensions (width × height × depth)
211 × 149 × 443 mm
(8 3/8 × 5 7/8 × 17 1/2 inches)



Tape transport control system

Tape speed 28.193 mm/s (DSR-70)
28.221 mm/s (DSR-70P)
Recording/playback time
More than 184 min (PDV-184ME)
More than 40 min (PDVM-40ME)
Fast forward/rewind time
Less than 3 min (PDV-184ME)
Less than 1 min (PDVM-40ME)
Search speed Up to 32 times normal in both directions

Specifications

Video performance

Band width
- Composite (DSR-70): 30 Hz to 4.2 MHz ±1.0 dB (Y)
- Composite (DSR-70P): 25 Hz to 4.8 MHz ±1.0 dB (Y)
- S-Video (DSR-70): 30 Hz to 5.0 MHz ±1.0dB (Y), 5.75 MHz +1.0/–3.0 dB (Y) (TM)
- S-Video (DSR-70P): 25 Hz to 5.0 MHz ±1.0dB (Y), 5.5 MHz +1.0/–2.0 dB (Y), 5.75 MHz +1.0/–3.0 dB (Y)(TM)
- Component (DSR-70): 30 Hz to 5.0 MHz ±1.0 dB (Y), 5.75 MHz +0/–3.0 dB (Y) (TM), 30 Hz to 1.3 MHz ±1.0 dB (C), 1.5 MHz +1.0/–5.0 dB (C)
- Component (DSR-70P): 25 Hz to 5.0 MHz ±1.0 dB (Y), 5.5 MHz +1.0/–2.0 dB (Y), 5.75 MHz +1.0/–3.0 dB (Y) (TM), 25 Hz to 1.5 MHz ±1.0 dB (C), 2.0 MHz +1.0/–2.0 dB (C)

S/N
- Composite I/O (Y): More than 53 dB
- S-Video I/O (Y): More than 55 dB
- Component I/O (Y): More than 55 dB

Y/C delay: Less than 30 ns

K-factor: Less than 2.0% (K2T, KPB)

Processor adjustment range

Video level: ±3 dB/–∞ to 3 dB selectable

Chroma level: ±3 dB/–∞ to 3 dB selectable

Set up/Black level: ±30 IRE/210 mV

Chroma phase: ±30˚

Audio performance

Frequency response
- 2 ch (48 kHz/16 bit): 20 Hz to 20 kHz +0.5/–1.0 dB
- 4 ch (32 kHz/12 bit): 20 Hz to 14.5 kHz +0.5/–1.0 dB

Dynamic range: More than 85 dB

Distortion: Less than 0.1%

Input connectors

Digital input

DV IN/OUT (When using DSBK-140 i.LINK/DV Input/Output Board)
6-pin IEEE1394 connector ×1

SDTI (QSDI) IN (When using DSBK-150 SDTI (QSDI) Input/Output Board)
BNC type ×1, SDTI (QSDI) format (270Mbps)

SDI IN (When using DSBK-160 SDI Input/Output Board)
BNC type ×1, SMPTE 259M, SDI format (270Mbps)

Analog video input

VIDEO INPUT: BNC type ×2 (loop-through), composite, 1.0 Vp-p, 75 Ω, sync negative

REF. VIDEO IN: BNC type ×2 (loop-through), black burst, 0.286 Vp-p (DSR-70) or 0.3 Vp-p (DSR-70P), 75 Ω, sync negative

S VIDEO IN: DIN 4-pin ×1
Y: 1.0 Vp-p, 75 Ω, sync negative
C: 0.286 Vp-p (DSR-70) or 0.3 Vp-p (DSR-70P), 75 Ω (burst level)

Y/R–Y/B–Y (when using DSBK-170 Analog Component Input/Output Board)
BNC type ×3 (with input/output selection switch), component video
Y: 1.0 Vp-p, 75 Ω, sync negative
R–Y: 0.7 Vp-p, 75 Ω (75% for DSR -70 or 100% for DSR-70P)
B–Y: 0.7Vp-p, 75 Ω (75% for DSR -70 or 100% for DSR-70P)

Analog audio input

AUDIO INPUT: XLR 3-pin (female) ×2
+4/0/–60 dBu, high impedance, balanced

Timecode input

TC IN: BNC type ×1, SMPTE
0.5 to 18 Vp-p, 3.3 kΩ, unbalanced

Output connectors

Digital output

DV IN/OUT (When using DSBK-140 i.LINK/DV Input/Output Board)
6-pin IEEE1394 connector ×1

SDTI (QSDI) OUT (When using DSBK-150 SDTI (QSDI) Input/Output Board)
BNC type ×1, SDTI (QSDI) format (270Mbps)

SDI OUT (When using DSBK-160 SDI Input/Output Board)
BNC type ×1, SMPTE 259M, SDI format (270Mbps)

Analog video output

VIDEO OUTPUT 1, 2 (SUPER)
BNC type ×2, composite, 1.0 Vp-p, 75 Ω, sync negative

REF. VIDEO OUT
BNC type ×2 (loop-through), composite sync, 0.286 Vp-p (DSR-70) or 0.3 Vp-p (DSR-70P), 75 Ω, sync negative (with burst)

S VIDEO OUT: DIN 4-pin×1
Y: 1.0 Vp-p, 75 Ω, sync negative
C: 0.286 Vp-p (DSR-70) or 0.3 Vp-p (DSR-70P), 75 Ω (burst level)

Y/R–Y/B–Y (when using DSBK-170 Analog Component Input/Output Board)
BNC type ×3 (with input/output selection switch), component video
Y: 1.0 Vp-p, 75 Ω, sync negative
R–Y: 0.7 Vp-p, 75 Ω (75% for DSR-70 or 100% for DSR-70P)
B–Y: 0.7Vp-p, 75 Ω (75% for DSR-70 or 100% for DSR-70P)

Analog audio output

AUDIO OUTPUT
XLR 3-pin (male) ×2, +4/0/–6 dBu (selectable by menu setting), 600 Ω loaded, low impedance, balanced

MONITOR AUDIO
Phono jack ×1, –6 dBu, 47 kΩ load, unbalanced

Headphone output

HEADPHONES: Stereo phone jack ×1, –∞ to –20 dBu, 8 Ω, unbalanced

Timecode output

TC OUT: BNC type ×1, SMPTE
2.2 Vp-p±3.0 dB, 600 Ω, unbalanced

Control connector

REMOTE: D-sub 9-pin ×1, for connection with another DSR-70/70P unit or other editing control unit, complied with RS-422A

Power input

DC IN: XLR 4-pin (male)

Accessories supplied

Shoulder belt (1)
Connector caps (1 set)
Operating Instructions (1)
ClipLink Guide (1)

Accessories not supplied

DSBK-140 i. LINK/DV Input/Output Board
DSBK-150 SDTI (QSDI) Input/Output Board
DSBK-160 SDI Input/Output Board
DSBK-170 Analog Component Input/Output Board
DSBK-180/180P Dual Video Input Board
BKNW-225 Docking Kit
RCC-5G/10G/30G 9-pin Remote Control Cable (5 m (16 ft)/10 m (33 ft)/30 m (98 ft) in length)
BP-90A/L60/L60A/L90/L90A Battery Pack
DC-L90/210 Battery Adaptor
BC-210/210CE/410/410CE/L50/L100/L100CE Battery Charger
AC-DN2/DN2A/550/550CE/CMA-8A/8ACE AC Adaptor
PDV-64ME/94ME/124ME/184ME Digital Video Cassette (standard size)
PDVM-12ME/22ME/32ME/40ME Digital Video Cassette (mini-size)
DV12CL Cleaning Cassette (standard size)
DVM12CL Cleaning Cassette (mini-size)

Related products

DNW-A25/A25P Betacam SX Digital Videocassette Recorder
ES-7 EditStation
DSR-300/300P Digital Camcorder

Design and specifications are subject to change without notice.

Glossary

Assemble editing
Editing in which new video/audio is added in sequence to the end of existing recorded video/audio. *See also "Insert editing".*

Bridge connection
A connection which allows a signal input to an input terminal to pass through the unit and exit from an output terminal as input to external equipment.

B–Y signal
One of the color difference signals, the B (blue) signal minus Y (luminance) signal.

C signal
See "Chrominance signal".

Capstan
A drive mechanism that moves the tape at a specified speed. Its rotation is normally synchronized with a reference sync signal.

Chrominance signal
A signal which carries information about hue and saturation. Also called "C signal".

Condensation
Moisture which condensed on tape transport mechanisms. If there is condensation on the head drum, tape sticks to drum and the VCR may malfunction.

Component video signal
A signal that consists of a luminance signal (Y) and two chrominance signals (R–Y, B–Y).

Composite video signal
A signal that consists of video, sync and color burst signals.

CTL
Control signal in the form of regular pulses recorded along a longitudinal track on the videotape. By counting these pulses, it is possible to determine the number of frames, and hence the tape's running time. Used mainly to adjust the tracking position of video heads, and to achieve timecode continuity in continuous recording.

Digital VCR
On a digital VCR, video and audio signals are recorded on magnetic tape and, unlike on an analog VCR, can be played back without any quality deterioration.

Drop frame mode
Time code runs at 30 frames/sec. The NTSC system, however, runs at about 29.97 frame /sec. Drop frame mode adjusts this difference. The timecode and video are synchronized by dropping the first two frames of the timecode every minute, except at the ten-minute marks.

Drum
See "Head drum".

E-E mode
Abbreviation of "Electric to Electric" mode. In this mode, video and audio signals input to the VCR are output after passing through internal electric circuits, but not through magnetic conversion circuits such as heads and tapes. This can be used to check input signals and for adjusting input signal levels.

Emphasis
The signal is emphasized at high frequencies. During playback, it is de-emphasized. This suppresses noise without affecting the original signal.

External lock/Gen-lock
Synchronizing one equipment (controlled or slave unit) to another (controlling or master unit). The signal and tape run of the VCRs used for editing, player and recorder, are usually synchronized.

Gen-lock (generator lock)
See "External lock".

Head drum
A metal cylinder to which a video head is attached. This drum is rotated at high speeds in synchronization with the sync signal during recording and playback.

Insert editing
Editing in which new video/audio is added into the middle of existing recorded video/audio. *See also"Assemble editing".*

IRE
A unit for representing a video level laid down by the IRE (Institute of Radio Engineers). The IRE is now the IEEE (Institute of Electric and Electronic Engineers).

Linear editing
Editing while playing back video and audio signals recorded on video tape. *See also"Non-linear editing".*

Loading
Also called "threading". To pull the tape out of the cassette case, thread it along the specified tape path, and wrap it on the drum in order to prepare it for recording or playback. The VCR automatically loads the cassette tape when you insert the cassette into the cassette compartment. There are two loading modes: standby-on mode and standby-off mode.

LTC
Abbreviation of "Longitudinal Time Code". This timecode is recorded on a longitudinal track on the tape. Reading is unreliable at low speeds, and not possible at all during still playback. See also "VITC".

Luminance signal
A signal that determined the brightness of the picture. Also called "Y signal".

Non-drop frame mode
The number of frames of the timecode and video run is not adjusted. When you use the timecode in non-drop frame mode, the real playback time will be about 86 seconds shorter per day than the timecode. If you edit frame by frame or if you determine the length of a shot by counting the timecode, use drop frame mode.

Non-linear editing
Editing while playing back video and audio signals recorded on hard disks. Video scenes stored on disk can be cued up quickly, for increased editing efficiency. *See also"Linear editing".*

Preroll
Running of a video tape to a prior to an edit-start point to enable the tape to reach a steady speed and to be synchronized with other video tapes.

Quantization
The level resolution when an analog signal is sampled before converted into a digital signal. 8-bit quantizing has 256 levels and 16-bit quantizing has 1024 levels. Generally, 8-bit quantizing is used for video signals and 16-bit quantizing is used for audio signals. The fewer the quantizing steps, the more distortion is in the analog signal when the digital signal is reconverted into analog signal.

Reference video signal
A video signal which contains a sync signal or sync and burst signals, used as a reference for synchronization of video equipment.

R–Y signal
One of the color difference signals, the R (red) signal minus Y (luminance) signal.

Sampling frequency
The unit of time used when converting an analog signal with a continuously varying level to digital form by sampling the level at a fixed interval. In general, a higher sampling frequency makes it possible to digitize analog signals of a higher frequency.

SCH
Abbreviation of Sub Carrier to Horizontal. The phase of the subcarrier with respect to the phase of the horizontal synchronization signal. In editing of monochrome video, phase continuity is maintained by editing in units of frames (two fields), so that the continuity of the horizontal synchronization signal phase is maintained. Editing of color video must be done in units of two frames (four fields) to maintain subcarrier continuity. The SCH of a field can be checked to find out which of the four fields it represents. This allows edited video signals to be joined while maintaining subcarrier continuity.

Search
Viewing the picture or timecode by running the tape in fast forward or rewind mode, in order to search for a particular scene.

Servo
A mechanism that controls the number and phase of rotations of the head drum or capstan. Servo mechanism allows playback of the video signal without guard band noise. The reference signal of the servo control is normally a vertical sync signal.

Servo lock
This refers to the synchronization of the phase of the drum rotation and the reference signal for the tape transport position, so that the video heads can trace the same pattern on the tape for playback and recording.

Setup (for DSR-70)
The difference between the reference black level and the blanking level of a composite signal.

SMPTE
Abbreviation of Society of Motion Picture and Television Engineers, a professional association established in the USA.

S/N
Signal-to-Noise ratio. The relation of the strength of the desired signal to the accompanying electronic interference, the noise. If S/N is high, sounds are reproduced with less noise and pictures are reproduced clearly without snow.

Standby-off mode
One of the stop modes. In this mode, head drum rotation is stopped and the tape tension is slackened. It is not possible to switch instantaneously from this mode to recording or playback mode. This mode is not harmful to the tape or heads.

Standby-on mode
One of the stop modes. In this mode, the head drum continues rotating and the tape remains wound onto the drum. This mode enables instantaneous switching to recording or playback mode. To prevent damage to the tape or heads, the device automatically switches from standby-on mode to standby-off mode after a certain period of time.

Subcarrier
Color information contained in a composite video signal. Its amplitude is for color saturation and its phase to color burst is for hue.

Superimpose
To put one picture (or characters) onto another so that both can be seen at the same time.

S-video
A singal format in which Y (luminance) and C (chrominance) signals are separated to reduce interference between them so that noiseless images are reproduced.

Sync
A reference signal consisting of vertical and horizontal sync signals used for synchronizing the scanning patterns of the video camera and the monitor.

Synchronization
In video editing, alignment of the position and speed of player and recorder VCRs tapes. Carried out during preroll in order to increase editing precision.

Tape tension
The tension applied to a tape. For the tape to run properly while being wound on the drum, it must be pulled lightly in the opposite direction to the direction of transport. Improper adjustment of tape tension can cause deviations along the temporal signal axis. In analog VCRs, these deviations are evident as skew and distortion in the upper part of the screen.

TBC
Abbreviation of Time Base Corrector. Electronic circuits to electrically stabilize the playback signals by removing color variation and roll in the playback picture caused by irregularity in drum rotation and tape movement. Time base correction reduces deterioration of picture quality when transmitting or copying playback signals.

Threading
See"Loading".

Time code
The timecode is a tape position information signal that includes time and frame data that are recorded onto the tape so as to facilitate searching of editing points and recorded scenes when viewing or editing.
SMPTE timecode is applied to NTSC system, and EBU timecode is applied to PAL/SECAM systems. There are two kinds of signal recorded on tape. One is longitudinal timecode (LTC) recorded along the tape (the same way as audio and CTL signals). The other is vertical interval timecode (VITC). This code is inserted in the vertical blanking period and it is recorded on the tape with video signals.

Time data
This refers either to time data that is generated by a timecode generator or time data that is played back from a tape and read by a timecode reader.

Unloading
When the EJECT button is pressed, the VCR automatically winds the tape back into the cassette case. Also called "Unthreading".

Glossary

Unthreading
See “Unloading”.

User bits
These are also referred to as “user’s bits”. The user bits are a 32-bit segment of the timecode recording area. The user can select what to record in this segment and how to use the recorded data. For example, it can be used to record date information in addition to the timecode data or ID numbers for tape reels or programs.

V (vertical)-blanking
The portion of the video signal that occurs between the end of one field and the beginning of the next. During this time, the electron beams in monitors are turned off so that they can return from the bottom of the screen to the top without showing tracks of movement on the screen. When the position of v-blanking is not adjusted correctly, a horizontal black bar appears on the screen.

Video gain
Amount of amplification for video signals, expressed in decibels (dB).

VITC
Abbreviation of “Vertical Interval Time Code”. This timecode is inserted in the vertical blanking interval and recorded on the video tracks. It can be read at low speeds and during still playback, but not during high-speed playback.
See also “LTC”.

Y signal
See “Luminance signal”.

Index

A

Aborting an edit 58
AC power 32
AC-550/550CE 33
AC-DN2/DN2A 33
AGC 70
Alarm messages 131
ASSEMBLE button and indicator 20
Assemble editing 47
Assemble mode 47
Audio control section 21
AUDIO IN button 21
AUDIO INPUT CH-1 to CH-4 level adjustment knobs 21
AUDIO INPUT CH-1/CH-2 connectors 25
AUDIO INPUT CH-1/CH-2 level switches 24
AUDIO INPUT PRESET/VARIABLE switch 21
Audio level meter 15
Audio mode indication 66
Audio monitor speaker 15
AUDIO OUTPUT CH-1/3 and CH-2/4 connectors 25
Audio recording mode indication 67
Audio settings page indication 67
Audio settings pages 70
Audio settings subpages 71
Audio signal settings 66, 70
AUTO EDIT button 21

B

BACKLGT setting 74
Basic menu 101
  items 101
  operations 104
BAT-END setting 74
BAT-NE setting 74
Batteries 29
Battery connector 23
Battery packs
  BP-90/90A 29, 31
  BP-L60/L60A/L90/L90A 29, 30
BAT-TYP setting 74
BKNW-225 125
BP-90/90A Battery Pack 29, 31
BP-L60/L60A/L90/L90A Battery Pack 29, 30
BREAKER button 24
BRIGHT/CONTRAST knob 14

C

Cassette compartment 19
Cassettes 43
  ejecting 46
  loading 45
CHARACTER switch 19
Checking edit points 52
CHROMA knob 22
CHROMA PHASE knob 23
ClipLink function 10
CLIPLINK indication 66
ClipLink log data
  adding 97
  automatically creating 99
  changing Mark IN/OUT points 94
  changing reel number 94
  changing the OK/NG status 95
  cuing up 93
  deleting 97
  display 92
  rewriting 94
ClipLink operation 91
Combining two VCRs 125
Condensation 127
Connections 29, 113
  component analog recording 117
  cut editing using i.LINK 36, 113
  cut editing using SDI 115
  digitally dubbing signals in DVCAM format 124
  digital nonlinear editing using SDTI (QSDI) 114
  i.LINK connections 36
  parallel recording using two units 120
  sequential recording using two units 118
  two-iuput switched video recording 123
  two-unit synchronous playback 122
Continuous editing 77
Control panel 16
COUNTER SELECT button 14
Cuing up edit points 53
Cut editing using two DSR-70/70P units 36

D

DC IN connector 26
DELETE button 21
Deleting an edit point 55
DF/NDF setting 73
Digital hours meter 128
Digitally dubbing signals in DVCAM format 85
Display panel 14
Docking kit 125
DSBK-140 12, 27, 36, 85, 113
DSBK-150 12, 27, 85, 114
DSBK-160 12, 27, 115
DSBK-170 12, 27, 117
DSBK-180/180P 12, 82, 123
Duration between edit points 52
DV IN/OUT connector (DSBK-140) 27
DVCAM format 9

E

Edit 37
  aborting 58
  continuous editing 77
  executing 57
  manual editing 78
  monitoring 57
  operation sequence 37
  outline 57
  previewing 54, 58
  quick editing 75
  redoing 59
  starting 58
  stopping 58
EDIT button 18
Edit mode 47
Edit points
  deletion 55
  checking 52
  cuing up 53
  finding 49
  modifying 55
  setting 50
  setting using recorder only 56
E-E mode 17, 18
EJECT button 19
Ejecting cassettes 46
ENTRY/SHIFT button 21
Error messages 131
Executing an edit 57
Extended menu 106
  items 106
  operations 112
  sub-items 112
External lock 65

Index

F

F FWD button 18
Features 9
Finding edit points 49
48V ON/OFF switches 24
Front control section 22
F-RUN/R-RUN setting 73

G

General settings pages 73

H

Head cleaning 127
HEADPHONES jack 23
HOLD button 14

I

i.LINK (DV) 10
i.LINK connections 36, 113
i-dot-link DV 10
IN/OUT buttons 21
Initial timecode value 63
Input audio signal indication 67
Input video signal indication 67
INSERT buttons and indicators 20
Insert editing 48
Insert mode 48
Interfaces 10

J

Jog and shuttle dials 18

K

KEY INH setting 73

L

LCD monitor 14, 61
  adjusting the screen 61
  displaying superimposed text information 61
  information displayed 61
LEVEL knob 23
LIGHT switch 14
LIGHTSW setting 74
LIMITER 70
LINE OUT 71
Loading cassettes 45

M

Maintenance 127
Manual editing 78
MENU button 19
Menu system configuration 101
METER switch 14
MIX/SWAP 70
Modifying edit points 55
MONI.VR 71
MONITOR
  audio settings 71
  video settings 72
MONITOR AUDIO connector 25
Monitoring during an edit 57

N

NO EDIT indication 67

O

Operating mode settings 66
Optional boards 12
  DSBK-140 12, 36, 85, 113
  DSBK-150 12, 85, 114
  DSBK-160 12, 115
  DSBK-170 12, 117
  DSBK-180/180P 12, 82
Optional interface board fitting port 26
Output video signal phase 83
Overview 9

P

PAGE button 15
Parallel recording using two units 81
PB AUDIO CH-1 to CH-4 level adjustment sliders 22
PB AUDIO PRESET/VARIABLE switch 22
PB/EE setting 73
PLAY button 18
Playback 75, 88
  preparations 88
  two-unit synchronous playback 89
PLAYER button 19
Player settings 41
PLAYER/RECORDER indicators 19
POWER indicator 23
Power preparations 29
POWER switch 23
PP MODE 72
PP POSI. 72
PP SIZE 72
PREROLL button 17
Preroll 54
PRESET/REGEN setting 73
PREVIEW button 21
Previewing edit results 54
PROCESS CONTROL 72

Q

Quick editing 75

R

Rear panel 24
REC INHI indicator 17
REC INHI switch 19
REC/SAVE switch 44
REC/SEQ button 17
RECORDER button 19
Recorder settings 38
Recording 79
  parallel recording using two units 81
  preparations 79
  sequential recording using two units 80
  timecode 63
  two-input switched video recording 82
Redoing an edit 59
REF. VIDEO IN 75 Ω termination switch 25
REF. VIDEO IN/OUT connectors 25
Reference video signals 113
Remaining battery power display 67
Remaining tape time indication 66
REMOTE connector 26
REMOTE setting 73
REMOTE/LOCAL switch 16
RESET button 14
REVIEW button 21
Reviewing an edit 58
REW button 18

S

S VIDEO IN/OUT connectors 25
SDI IN/OUT 1,2 connectors (DSBK-160) 27
SDI 10, 115
SDTI (QSDI) 10, 114
SDTI(QSDI) IN/OUT connectors (DSBK-150) 27
Search button and indicators 18
Search 49
Selecting an edit mode 47
Sequential recording using two units 80
SERVO indicator 18
SET button 19
SET UP/BLACK LEVEL knob 23
Setting/settings 113
  audio signal input and output 70
  general settings 73
  edit points 50
  edit points using recorder only 56
  for editing 38
  initial timecode value 63
  operating mode 66
  player settings 41
  recorder settings 38
  time data 61
  user bits 64
  video/audio signals 66
  video settings 72
  when connecting editing control unit 115
Setup menu 101
  basic menu 101
  extended menu 106
  menu system configuration 101
Shoulder belt 126
  attachment fixture 24
Special editing 75
Specifications 135
STANDBY indicator 18
Starting an edit 58
STOP button 18
Stopping an edit 58
Sub LCD 15
Sub LCD menu 61
  audio settings pages 70
  audio signal settings 70
  basic operations 68
  display and settings 66
  general settings pages 73
  home page 66
  operation buttons 66
  video settings pages 72
Sub LCD operation buttons F1 to F4 15
Superimposed text information 61
Synchronizing with an external signal 65
System configuration 35
SYSTEM MENU screen 85

T

Tape transport section 17
TC IN connector 26
TC INT/EXT switch 19
TC OUT connector 26
Time data 61
  indication 66
  setting 61
Timecode
  external lock 65
  operation buttons 14
  recording 63
Top Panel 23
TRIM/CLIPLINK buttons 20
Troubleshooting 129
Two-iuput switched video recording 82
Two-unit synchronous playback 89

U

UP and DOWN buttons 15
User bits setting 64

V

VIDEO INPUT 75 Ω termination switch 25
VIDEO INPUT connectors 25
VIDEO knob 22
VIDEO OUTPUT 1/2 (SUPER) connectors 25
Video settings pages 72
Video signal settings 66

W

WARNING indicator 14
WIDE 72
Wide-screen aspect ratio 12

Y

Y, R–Y, B–Y connectors (DSBK-170) 27

Z

ZEBRA 72

SONY

3-865-065-**01**(1)

i.LINK/DV Input/ Output Board

設置説明書 2ページ ..... JP
Installation Instructions Page 11 ..... GB
Manuel d'installation Page 19 ..... FR
Installationsanleitung Seite 27 ..... DE
Istruzioni per l'installazione Pagina 35 ..... IT

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DSBK-140 DVCAM™ i

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For the customers in the USA
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada
This Class A digital apparatus complies with Canadian ICES-003.

http://getMANUAL.com

Table of Contents

Overview **12**
Components of the DSBK-140 13
Installation **14**
Preparations 14
Fitting Procedure 15
Attaching the Connector Cap 18

Overview

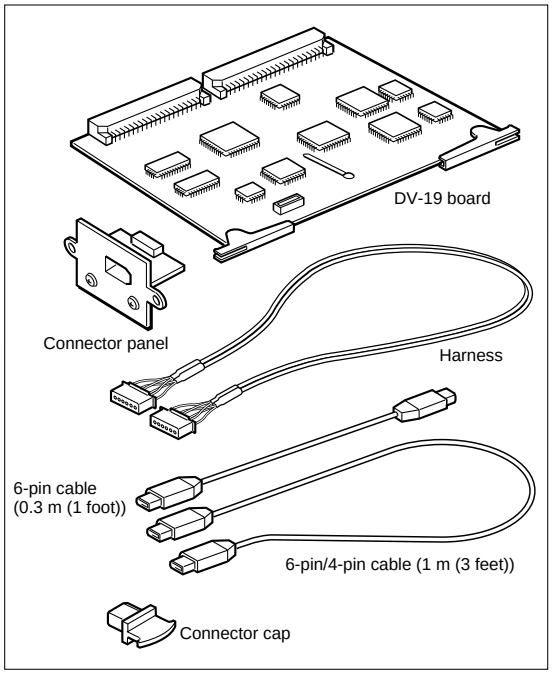
The DSBK-140 i.LINK/DV Input/Output Board is an optional board for the DSR-70/70P Sony Digital Videocassette Recorder. Installing this board in a DSR-70/70P gives the VCR the capability of being connected to another DSR-70/70P via an i.LINK/DV [1] cable to form a cut editing system. The board also allows the connection of a Sony consumer DV camera for direct recording and editing.

Refer to the DSR-70/70P Operating Instructions for information on connecting and operating the DSR-70/70P with the DSBK-140 installed.

1) i is a trademark of Sony Corporation and indicates that this product is in agreement with IEEE1394-1995 specifications and their revisions.

Components of the DSBK-140

The DSBK-140 consists of the following items.



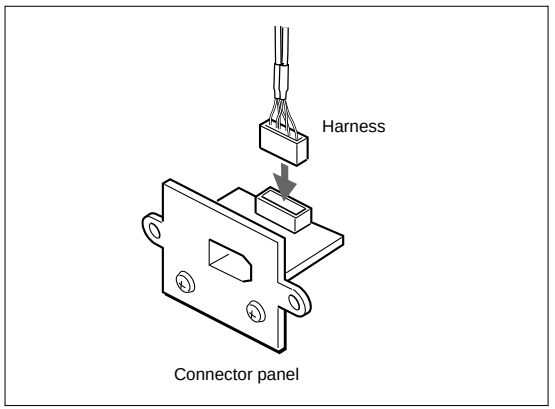
Installation

Caution

If this option is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

Preparations

Before installing the board into the VCR, first connect the harness to the connector panel.

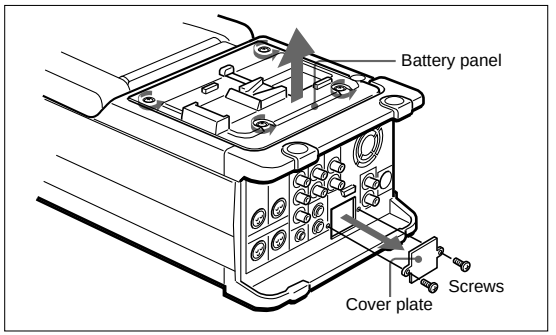


Fitting Procedure

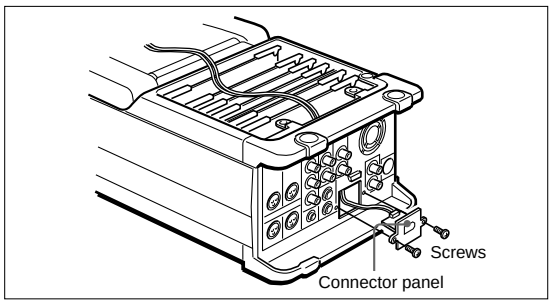
1 Remove the DSR-70/70P battery panel (four screws) and cover plate (two screws).

Note

Take care not to lose the cover plate or screws.



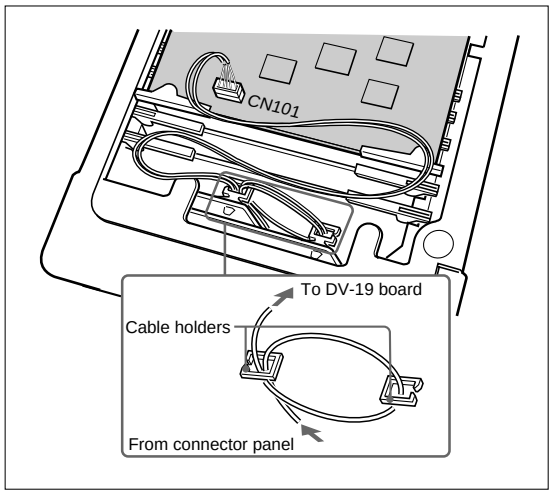
2 Insert the connector panel and its attached harness into the hole left by the cover plate. Pull the harness through the DSR-70/70P board slot space and up to the top.
Secure the connector panel using the screws removed from the cover plate in step **1**.



(Continued)

Installation

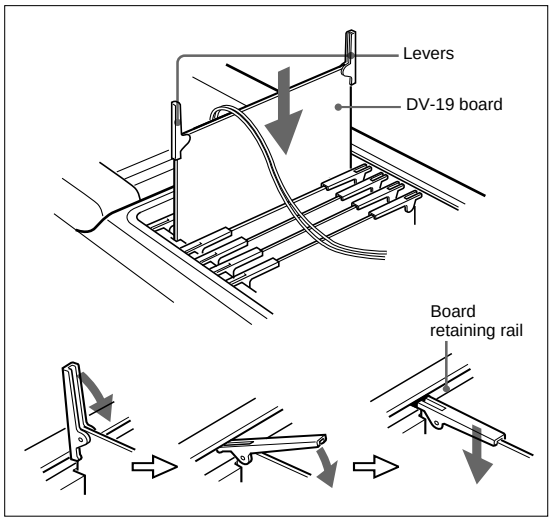
3 Take up the slack in the harness by inserting it first into the cable holder on the left, then into the cable holder on the right, then again into the cable holder on the left, as shown in the figure (left and right are as seen from the rear of the DSR-70/70P).
Place the DV-19 board above the opening where the battery panel was removed, and connect the harness to the CN101 on the board.



Notes

- When winding the harness around the cable holders, do not pull it tight. Loop it loosely through the cable holders as shown in the figure.
- Make sure that the harness does not pass over or under any board levers.

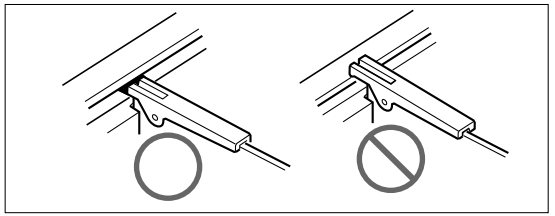
4 Insert the DV-19 board into the second slot from the front of the DSR-70/70P. Holding the levers on both sides of the board, slowly slide it into place.
When the board is inserted until the levers are aligned with the board retaining rail, lower the levers slightly to seat the board firmly, then lower the levers to be flush with the edge of the board.



(Continued)

Note

When lowering the levers, one or both of them may not properly seat inside the DSR-70/70P case.
If a lever is positioned as shown in the right side of the figure below, the DSR-70/70P battery panel will not close. Before attempting to replace the battery panel, check to make sure that the levers are properly seated under the board retaining rail, fully inside the DSR-70/70P case.



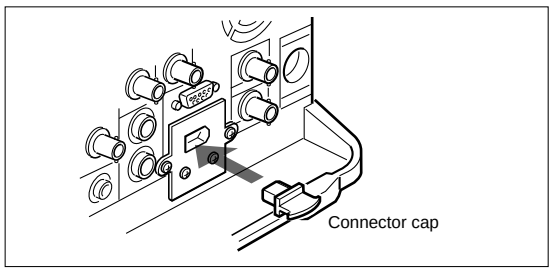
5 Replace the DSR-70/70P battery panel and secure it using the screws.

Note

Before replacing the battery panel, make sure again that the harness is not over any board levers. Be sure to pass the harness over the boards and push its slack into the space between boards.

Attaching the Connector Cap

When the DV IN/OUT connector is not being used, put the supplied connector cap on the connector.



SONY

3-865-066-**01**(1)

SDTI (QSDI) Input/ Output Board

設置説明書 2ページ JP
Installation Instructions Page 11 GB
Manuel d'installation Page 19 FR
Installationsanleitung Seite 27 DE
Istruzioni per l'installazione Pagina 35 IT

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DSBK-150 DVCAM™

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For the customers in the USA
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada
This Class A digital apparatus complies with Canadian ICES-003.

Table of Contents

Overview 12
Components of the DSBK-150 13
Installation 14
Preparations 14
Fitting Procedure 15
Attaching the Connector Caps 18

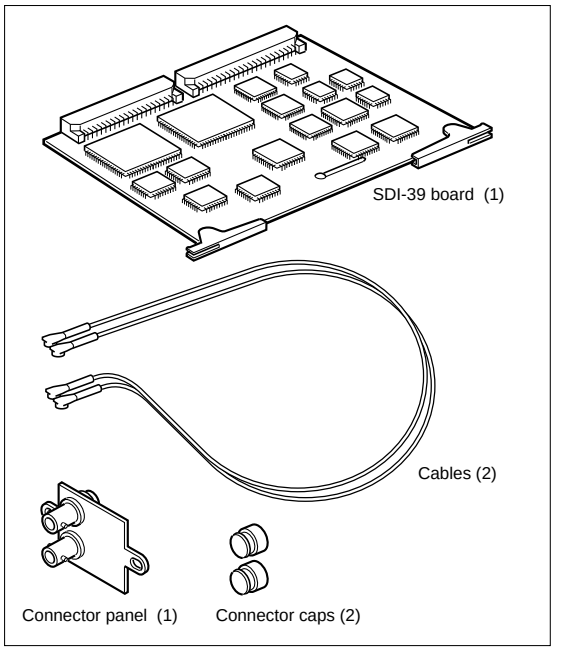
Overview

The DSBK-150 SDTI (QSDI) Input/Output Board is an optional board for the DSR-70/70P Sony Digital Videocassette Recorder. Installing this board in a DSR-70/70P gives the VCR the capability of being connected to an ES-7 EditStation™ to form a digital non-linear editing system. The board also allows the connection of a DSR-85/85P/80/80P/60/60P Digital Videocassette Recorder/Player for digital editing and dubbing.

Refer to the DSR-70/70P Operating Instructions for information on connecting and operating the DSR-70/70P with the DSBK-150 installed.

Components of the DSBK-150

The DSBK-150 consists of the following items.



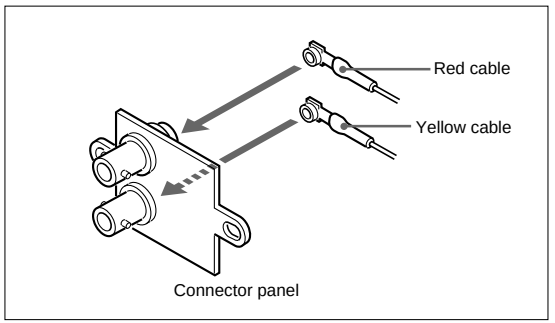
Installation

Caution

If this option is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

Preparations

Before installing the board into the VCR, first connect the two cables to the connector panel.
Connect the red cable to the SDTI IN connector, and the yellow cable to the SDTI OUT connector.

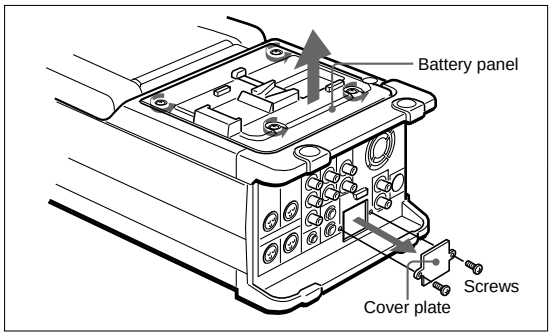


Fitting Procedure

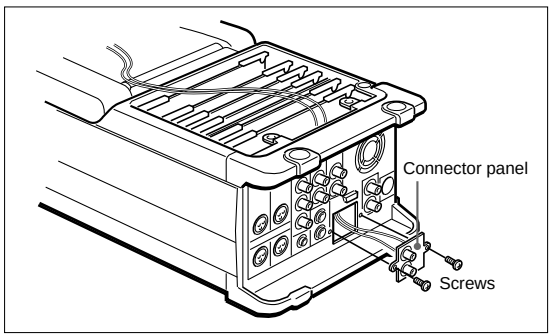
1 Remove the DSR-70/70P battery panel (four screws) and cover plate (two screws).

Note

Take care not to lose the cover plate or screws.



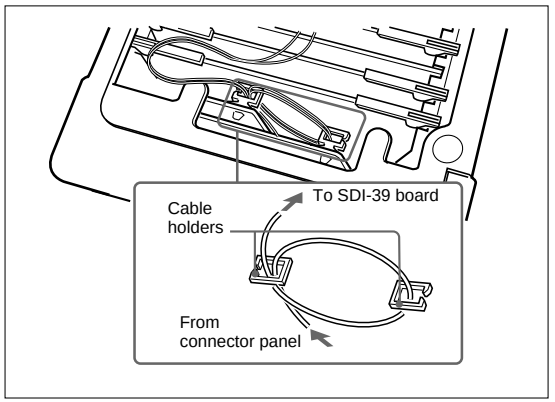
2 Insert the connector panel and its attached cables into the hole left by the cover plate. Pull the two cables one at a time through the DSR-70/70P board slot space and up to the top.
Secure the connector panel using the screws removed from the cover plate in step **1**.



(Continued)

Installation

3 Take up the slack in the cables by inserting them first into the cable holder on the left, then the cable holder on the right, then again into the cable holder on the left, as shown in the figure (left and right are as seen from the rear of the DSR-70/70P).



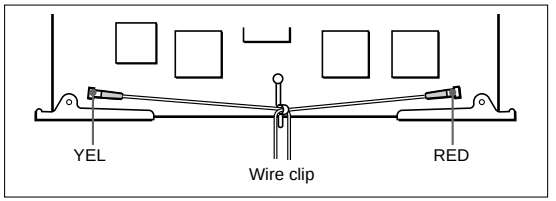
Notes

- When winding the cables around the cable holders, do not pull them tight. Loop them loosely through the cable holders as shown in the figure.
- Make sure that the cables do not pass over or under any board levers.

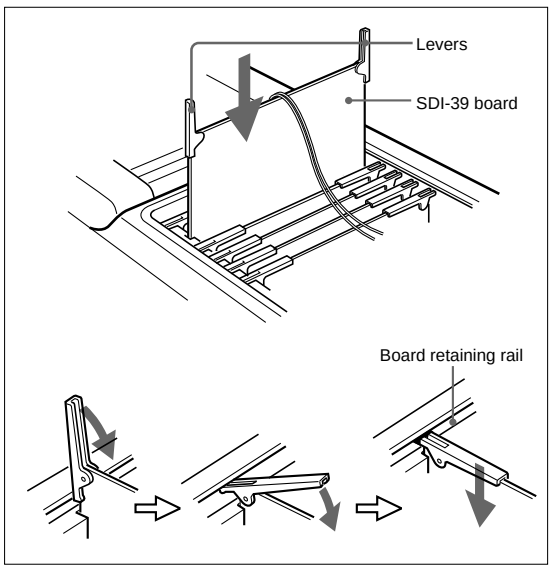
4 Place the SDI-39 board above the opening where the battery panel was removed, and connect the cables to the board.
Attach the red and yellow cables to their respective RED and YEL connectors on the board.

RED: red cable
YEL: yellow cable

Wind the wire clip around the cables.



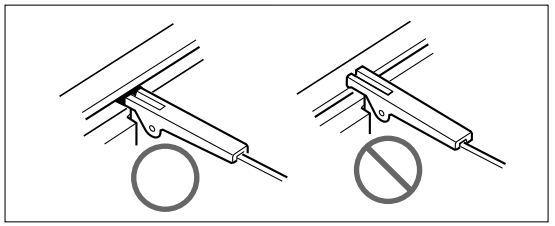
5 Insert the SDI-39 board into the second slot from the front of the DSR-70/70P. Holding the levers on both sides of the board, slowly slide it into place.
When the board is inserted until the levers are aligned with the board retaining rail, lower the levers slightly to seat the board firmly, then lower the levers to be flush with the edge of the board.



(Continued)

Note

When lowering the levers, one or both of them may not properly seat inside the DSR-70/70P case.
If a lever is positioned as shown in the right side of the figure below, the DSR-70/70P battery panel will not close. Before attempting to replace the battery panel, check to make sure that the levers are properly seated under the board retaining rail, fully inside the DSR-70/70P case.



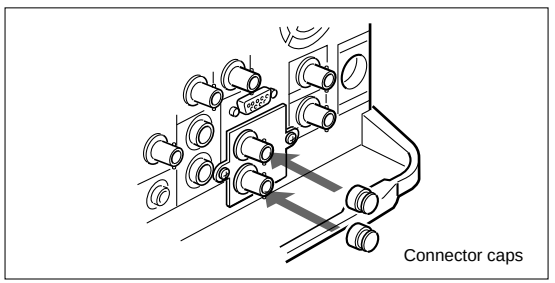
6 Replace the DSR-70/70P battery panel.

Note

Before replacing the battery panel, make sure again that the cables are not over any board levers. Be sure to pass the cables over the boards and push their slack into the space between boards.

Attaching the Connector Caps

When the SDTI IN and SDTI OUT connectors are not being used, put the supplied connector caps on the connectors.



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3-865-067-01(1)

SDI Input/Output Board

設置説明書 2ページ JP

Installation Instructions Page 11 GB

Manuel d'installation Page 19 FR

Installationsanleitung Seite 27 DE

Istruzioni per l'installazione Pagina 35 IT

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DSBK-160 DVCAM™

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For the customers in the USA
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada
This Class A digital apparatus complies with Canadian ICES-003.

Table of Contents

Overview 12
Components of the DSBK-160 13
Installation 14
Preparations 14
Fitting Procedure 15
Attaching the Connector Caps 18

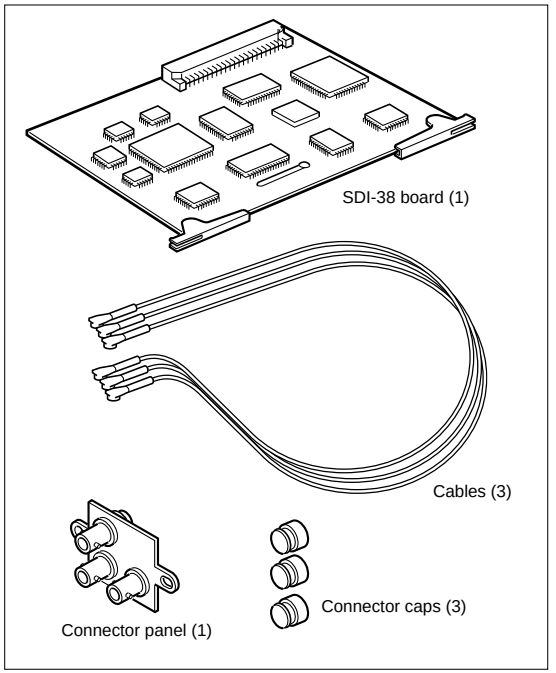
Overview

The DSBK-160 SDI Input/Output Board is an optional board for the DSR-70/70P Sony Digital Videocassette Recorder. Installing this board in a DSR-70/70P gives the VCR the capability of being connected to a DNW-A25/A25P Betacam SX Digital Videocassette Recorder to form a cut editing system.

Refer to the DSR-70/70P Operating Instructions for information on connecting and operating the DSR-70/70P with the DSBK-160 installed.

Components of the DSBK-160

The DSBK-160 consists of the following items.



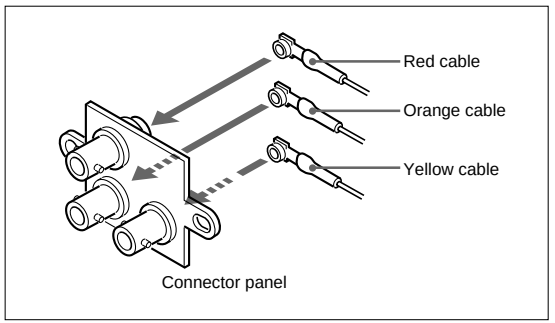
Installation

Caution

If this option is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

Preparations

Before installing the board into the VCR, first connect the three cables to the connector panel.
Connect the red cable to the SDI IN connector, the orange cable to the SDI OUT 1 connector, and the yellow cable to the SDI OUT 2 connector.

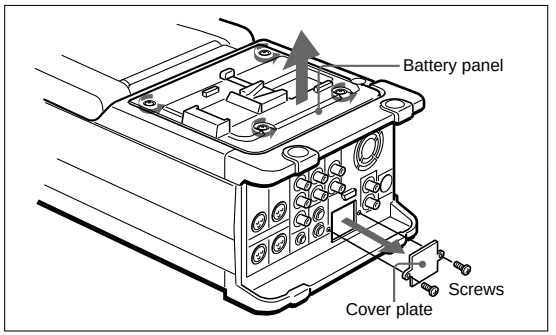


Fitting Procedure

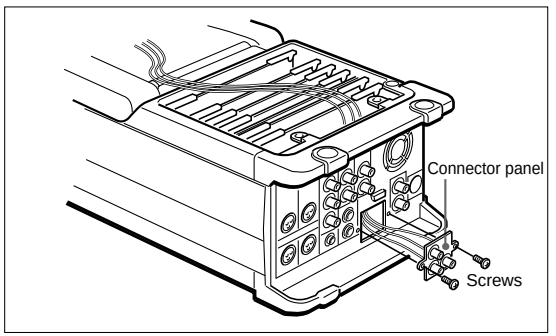
1 Remove the DSR-70/70P battery panel (four screws) and cover plate (two screws).

Note

Take care not to lose the cover plate or screws.



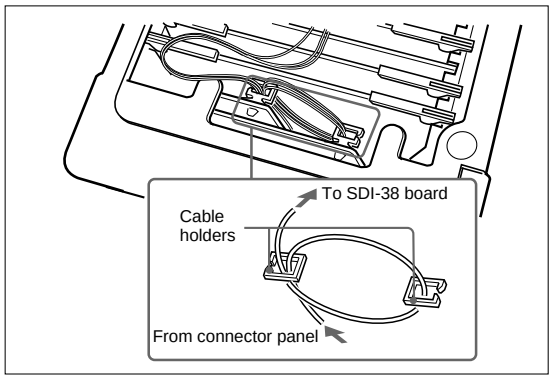
2 Insert the connector panel and its attached cables into the hole left by the cover plate. Pull the three cables one at a time through the DSR-70/70P board slot space and up to the top.
Secure the connector panel using the screws removed from the cover plate in step **1**.



(Continued)

Installation

3 Take up the slack in the cables by inserting them first into the cable holder on the left, then the cable holder on the right, then again into the cable holder on the left, as shown in the figure (left and right are as seen from the rear of the DSR-70/70P).



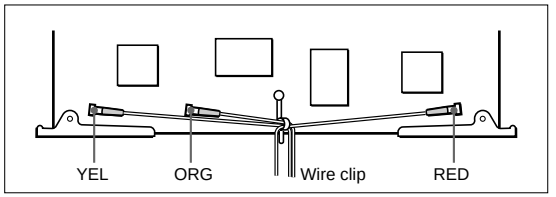
Notes

- When winding the cables around the cable holders, do not pull them tight. Loop them loosely through the cable holders as shown in the figure.
- Make sure that the cables do not pass over or under any board levers.

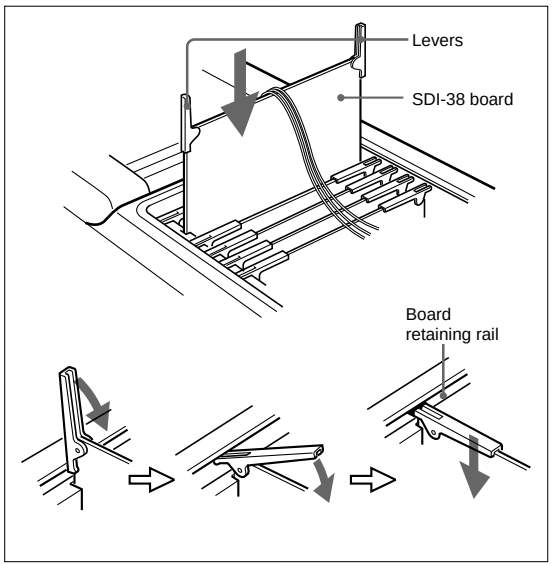
4 Place the SDI-38 board above the opening where the battery panel was removed, and connect the cables to the board. Attach the red, orange, and yellow cables to their respective RED, ORG, and YEL connectors on the board.

RED: red cable
ORG: orange cable
YEL: yellow cable

Wind the wire clip around the cables.



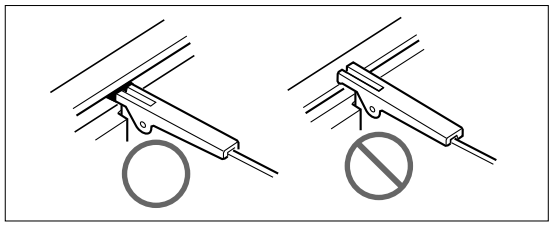
5 Insert the SDI-38 board into the second slot from the front of the DSR-70/70P. Holding the levers on both sides of the board, slowly slide it into place.
When the board is inserted until the levers are aligned with the board retaining rail, lower the levers slightly to seat the board firmly, then lower the levers to be flush with the edge of the board.



(Continued)

Note

When lowering the levers, one or both of them may not properly seat inside the DSR-70/70P case.
If a lever is positioned as shown in the right side of the figure below, the DSR-70/70P battery panel will not close. Before attempting to replace the battery panel, check to make sure that the levers are properly seated under the board retaining rail, fully inside the DSR-70/70P case.



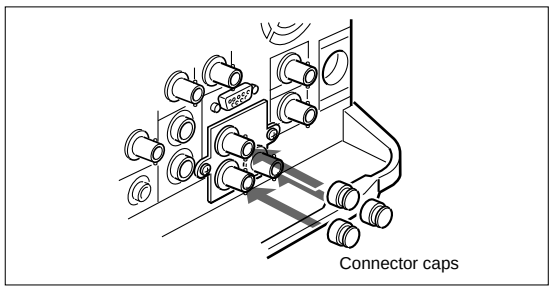
6 Replace the DSR-70/70P battery panel.

Note

Before replacing the battery panel, make sure again that the cables are not over any board levers. Be sure to pass the cables over the boards and push their slack into the space between boards.

Attaching the Connector Caps

When the SDI IN, SDI OUT 1, and SDI OUT 2 connectors are not being used, put the supplied connector caps on the connectors.



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3-865-068-01(1)

Analog Component Input/Output Board

設置説明書 2ページ JP

Installation Instructions Page 13 GB

Manual d'installation Page 22 FR

Installotionsanleitung Seite 31 DE

Istruzioni per l'instllazione Pagina 40 IT

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DSBK-170 DVCAM™

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For the customers in the USA
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For the customers in Canada
This Class A digital apparatus complies with Canadian ICES-003.

Table of Contents

Overview 14
Components of the DSBK-170 14
Installation 15
Preparations 15
Fitting Procedure 16
Attaching the Connector Caps 21

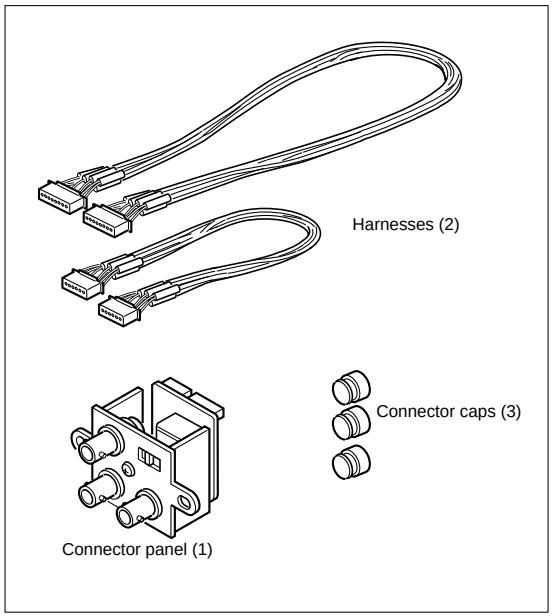
Overview

The DSBK-170 Analog Component Input/Output Board is an optional board for the DSR-70/70P Sony Digital Videocassette Recorder. Installing this board in a DSR-70/70P gives the VCR the capability of being connected to a Betacam SP Videocassette Recorder to carry out editing or dubbing.

Refer to the DSR-70/70P Operating Instructions for information on connecting and operating the DSR-70/70P with the DSBK-170 installed.

Components of the DSBK-170

The DSBK-170 consists of the following items.



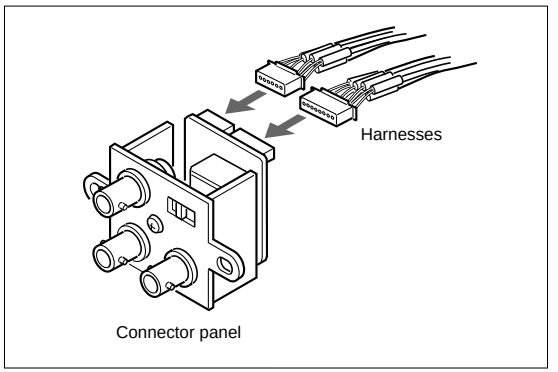
Installation

Caution

If this option is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

Preparations

Before installing the board into the VCR, first connect the two harnesses to the connector panel.

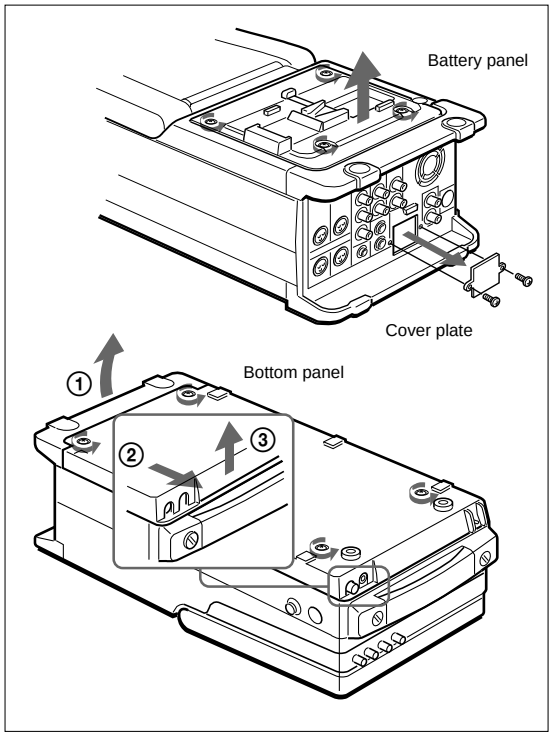


Fitting Procedure

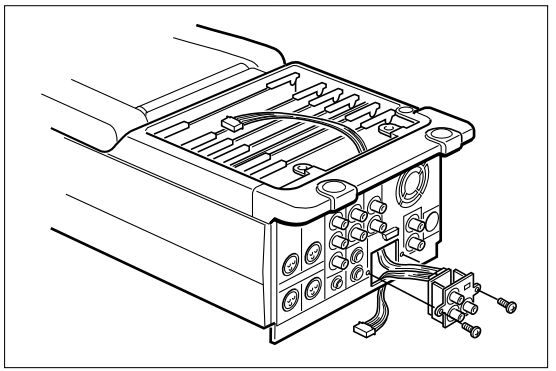
1 Remove the DSR-70/70P battery panel (four screws), bottom pannel (four screws) and cover plate (two screws). Follow the steps shown in the figure to remove the bottom panel (because there are switch and knob on the front panel).

Note

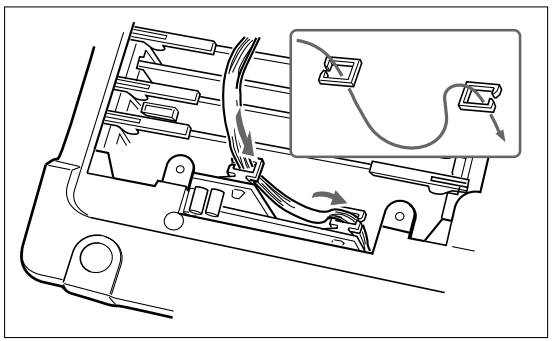
Take care not to lose the cover plate or screws.



2 Insert the connector panel and its attached harnesses into the hole left by the cover plate. Pull the long harness through the board slot space and out through the top, and the short harness out through the bottom.
Secure the connector panel using the screws removed from the cover plate in step **1**.



3 Route the harness through the cable holders, as shown in the figure.



(Continued)

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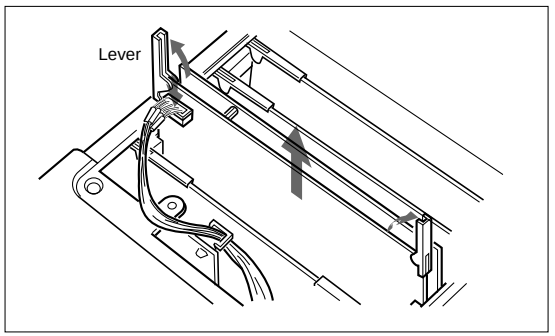
Installation

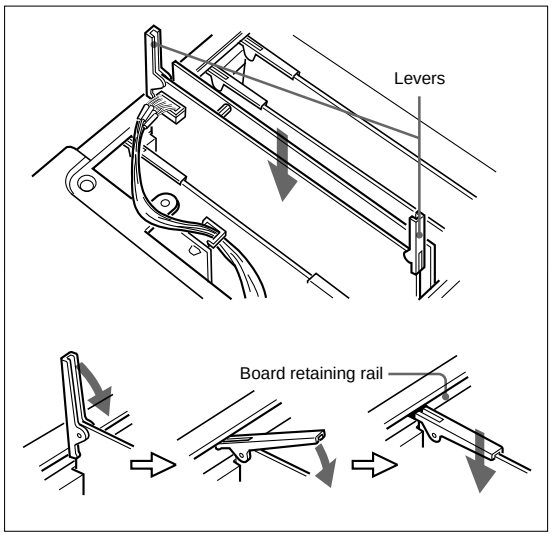
Notes

- When winding the harness around the cable holders, do not pull it tight. Loop it loosely through the cable holders.
- Make sure that the harness does not pass over or under any board levers.

4 Lift the levers on the board (DEN-11) in the second slot from the rear of the DSR-70/70P. Pull the board part of the way out of the slot and connect the harness to the board.



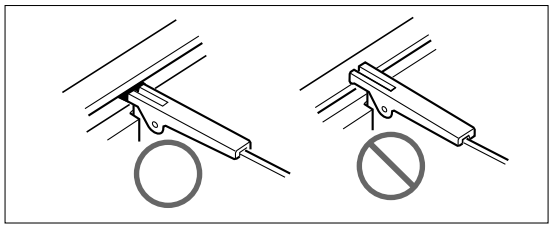
5 Holding the levers on both sides of the DEN-11 board, slowly slide it into place.
When the board is inserted until the levers are aligned with the board retaining rail, lower the levers slightly to seat the board firmly, then lower the levers to be flush with the edge of the board.



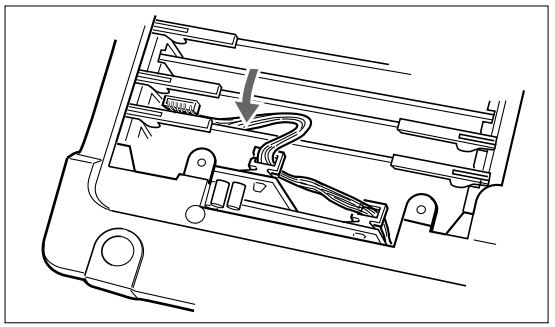
(Continued)

Note

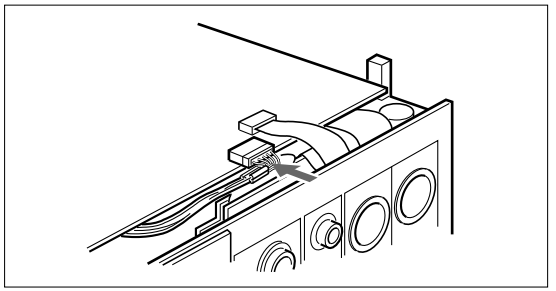
When lowering the levers, one or both of them may not properly seat inside the DSR-70/70P case.
If a lever is positioned as shown in the right side of the figure below, the DSR-70/70P battery panel will not close. Before attempting to replace the battery panel, check to make sure that the levers are properly seated under the board retaining rail, fully inside the DSR-70/70P case.



6 Push any extra slack in the harness down into the space between boards.



7 Connect the other harness to the board (DDE-13) attached to the bottom of the DSR-70/70P.



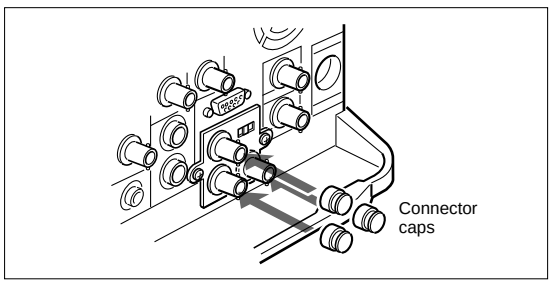
8 Replace the DSR-70/70P battery panel and bottom panel, and secure them using the screws.

Note

Before replacing the battery panel, make sure again that the harness is not over any board levers. Be sure to pass the harness over the boards and push its slack into the space between boards.

Attaching the Connector Caps

When the Y/R–Y/B–Y connectors are not being used, put the supplied connector caps on the connectors.



SONY

3-865-069-01(1)

Dual Video Input Board

設置説明書 2ページ ____ JP
Installation Instructions Page 8 ____ GB
Manuel d'installation Page 13 ____ FR
Installationsanleitung Seite 18 ____ DE
Istruzioni per l'installazione Pagina 23 ____ IT

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DSBK-180/180P DVCAM™

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English

Table of Contents

Overview 9
Components of the DSBK-180/180P 9
Installation 10
Preparations 10
Fitting Procedure 11

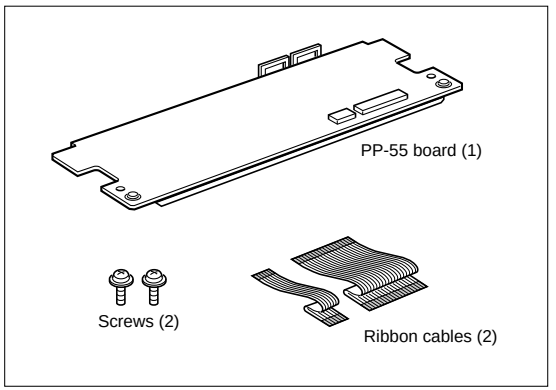
Overview

The DSBK-180/180P Dual Video Input Board is an optional board for the Sony DSR-70/70P Digital Videocassette Recorder. Installing this board in a DSR-70/70P allows two video cameras to be connected to the VCR so that you can carry out video recording switching between the signals from the two cameras.

Refer to the DSR-70/70P Operating Instructions for information on connecting and operating the DSR-70/70P with the DSBK-180/180P installed.

Components of the DSBK-180/180P

The DSBK-180/180P consists of the following items.



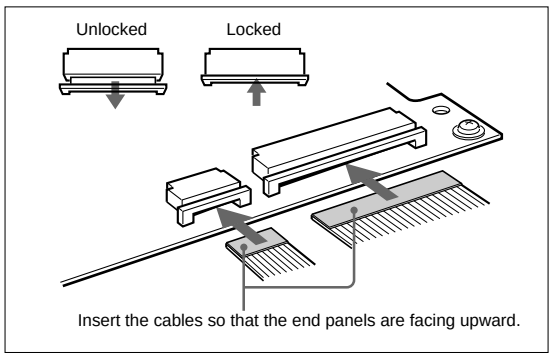
Installation

Caution

If this option is installed incorrectly, personal injury or damage to peripheral items may occur due to fire, shock, or other accidental circumstances. To avoid such risks, installation should be performed by qualified service personnel.

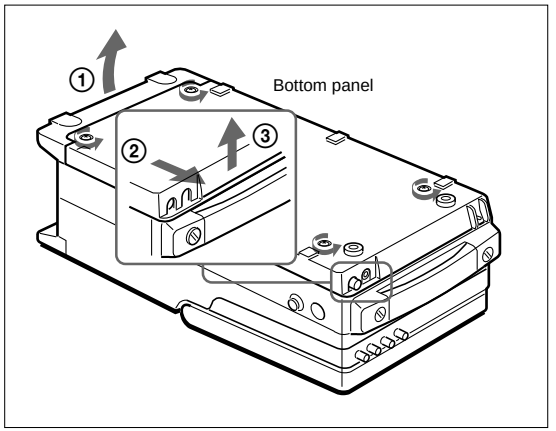
Preparations

Before installing the board into the VCR, first connect the two ribbon cables to the PP-55 board. (Take care not to insert the cable upside down.)
The ribbon cable connectors are equipped with locks. Make sure the connectors are unlocked before inserting the ribbon cable, and close the locks after the ribbon cables are inserted.



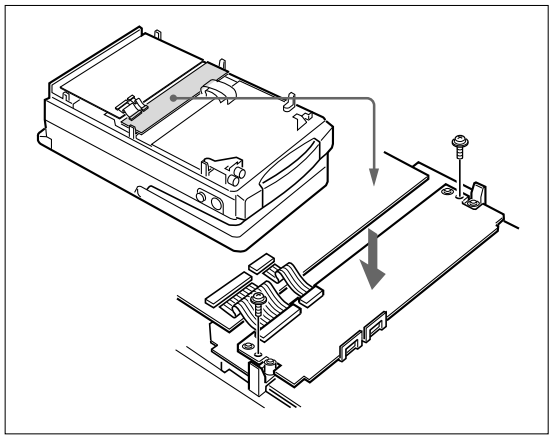
Fitting Procedure

1 Remove the DSR-70/70P bottom panel (four screws). Follow the steps shown in the figure to remove the bottom panel (because there are switch and knob on the front panel).

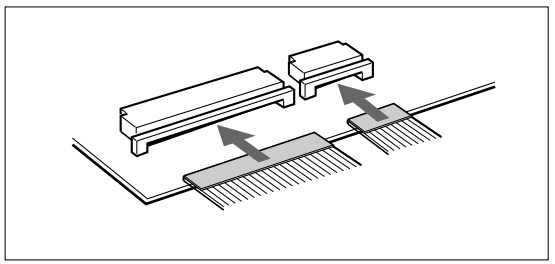


(Continued)

2 Place the board in the space next to where a board is installed and secure it with the supplied screws.



3 Connect the ribbon cables to the adjoining board and close the locks *(see "Preparations" on page 10)*.



4 Replace the DSR-70/70P bottom panel and secure it using the screws.

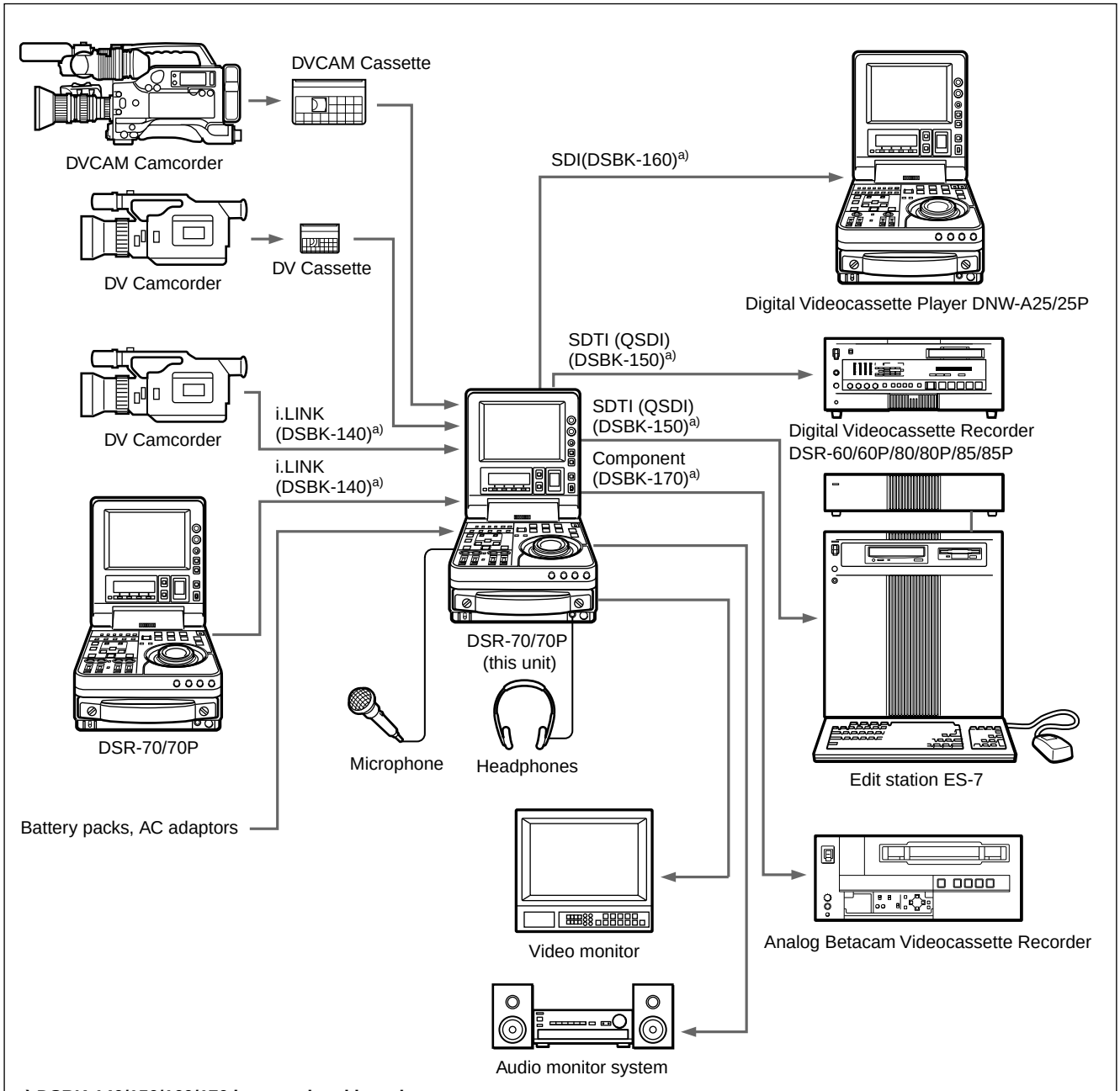
SECTION 2
SERVICE OVERVIEW

2-1. POWER SUPPLY

The DSR-70/70P runs by batteries or AC power. AC power should be used when checking or repairing the DSR-70/70P. Refer to the operation manual supplied with the DSR-70/70P for details.

Power requirements : DC 12V
Power consumption : 46 W (with no optional boards installed)

Usage Example



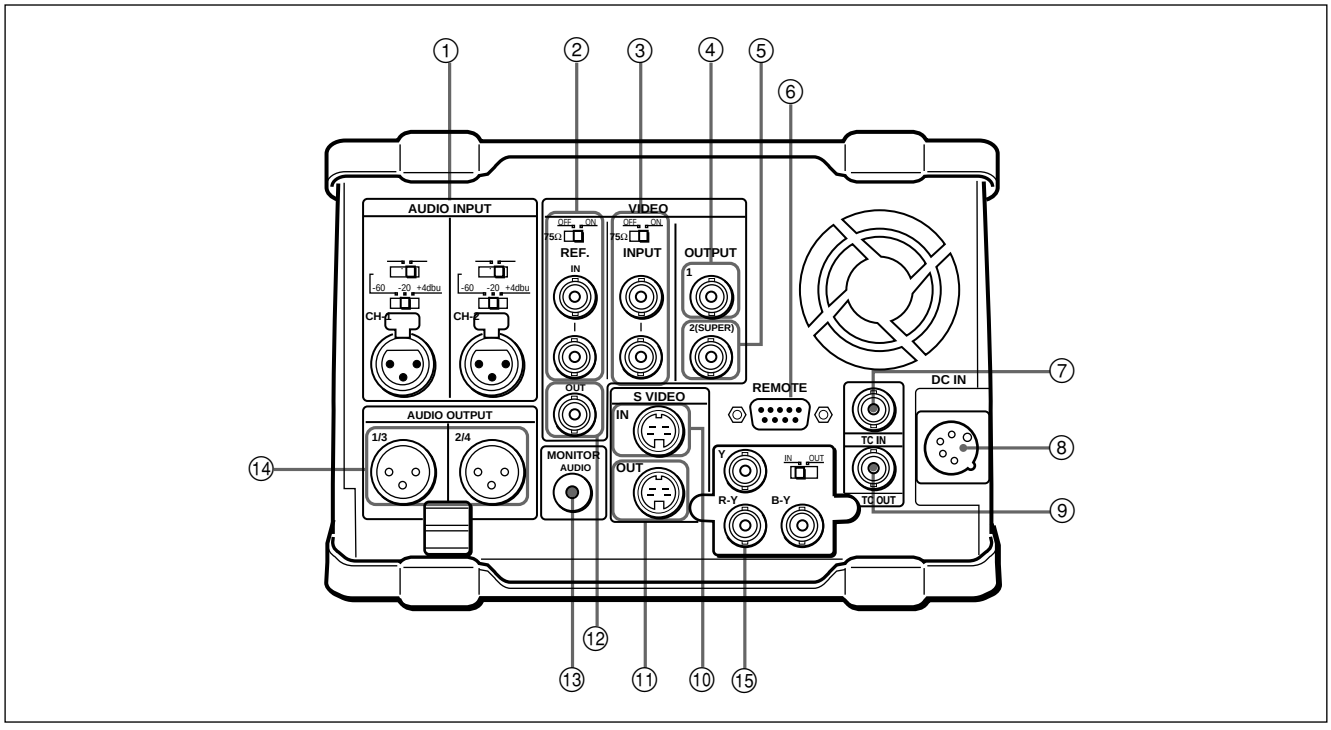
a) DSBK-140/150/160/170 is an optional board.

2-2. CONNECTORS AND CABLES

Use the following connectors or cables (or equivalents) to connect the DSR-70/70P.

Indication on Panel	Matching Connector (SONY Part No.)	Matching Cable (SONY Part No.)
VIDEO REF. IN VIDEO REF. OUT VIDEO INPUT VIDEO OUTPUT TC IN TC OUT COMPONENT VIDEO IN/OUT (DSBK-170)	Plug, BNC (1-564-742-11)	5C-2V or 3C-2V coaxial cable
SDI IN SDI OUT } (DSBK-160) SDTI (QSDI) IN SDTI (QSDI) OUT } (DSBK-150)	Plug, BNC (1-564-742-11)	BNC coaxial cable or 5C-2V coaxial cable / Cables manufactured by Fujikura Cable Inc. are recommended. (Maximum cable length: 200 m)
AUDIO INPUT	XLR 3P, MALE (1-508-084-00) Pin jack	———
AUDIO OUTPUT MONITOR OUTPUT	XLR 3P, FEMALE (1-508-083-00)	———
DC IN	XLR 4P, FEMALE (1-508-362-00)	DC power cord (1-551-577-00, an accessory of AC-550)
REMOTE	Plug 9P MALE (1-560-651-00) Shell, Junction 9P (1-561-749-00)	9-pin remote control cable or RCC-5G (5 m)/10G (10 m)/30G (30 m)
HEADPHONES	JM-60 stereo phone plug (commercially available)	———
S VIDEO IN S VIDEO OUT	DIN 4P DIN 4P	YC-15 V (1.5 m)
i.LINK (DSBK-140)	———	VMC-2DV (1-769-636-11)

2-3. INPUT/OUTPUT SIGNALS OF CONNECTORS



Communication Connectors

⑥	REMOTE	D-SUB 9-pin connector, 1 piece (RS-422A interface) Remote control

Input Connectors

①	AUDIO INPUT CH-1/CH-2	XLR 3-pin (female), 2 pieces Analog audio 2 channels −60 dBu, 0 dBu and +4 dBu selectable. High impedance, balanced
②	VIDEO REF. IN	BNC, 2 pieces (loop-through connection, with 75 Ω termination switch) External reference video signal (black burst or composite sync) 40 IRE/0.3 Vp-p, 75 Ω, sync negative
③	VIDEO INPUT	BNC, 2 pieces (loop-through connection with 75 Ω termination switch) Analog composite video 1.0 Vp-p, 75 Ω, sync negative
⑦	TC IN	BNC, 1 piece Time code 0.5 to 18.0 Vp-p, 3.3 kΩ , unbalanced
⑧	DC IN	XLR 4-pin (male), 1 piece DC +11 to 17 V
	BATTERY IN (battery sub panel)	5-pin, 1 piece Lithium-ion battery interface
⑩	S VIDEO INPUT	DIN 4-pin, 1 piece S-video signal

Output Connectors

④	VIDEO OUTPUT 1	BNC, 1 piece Analog composite video 1.0 Vp-p, 75 Ω, sync negative
⑤	VIDEO OUTPUT 2	BNC, 1 piece (Superimposition of characters is possible.) Analog composite video 1.0 Vp-p, 75 Ω, sync negative
⑨	TC OUT	BNC, 1 piece Time code 2.2 Vp-p ±3 dB (when loaded with 600 Ω), unbalanced
⑪	S VIDEO OUT	DIN 4-pin, 1 piece S-video signal
⑫	VIDEO REF. OUT	BNC, 1 piece Reference video signal
⑬	MONITOR OUTPUT	PIN jack, 1 piece Analog audio channel (AUDIO OUTPUT can be output when switched on the sub LCD menu.) –6 dBu (standard) (when loaded with 47 kΩ), low impedance, unbalanced
⑭	AUDIO OUTPUT 1/3, 2/4	XLR 3-pin (male), 2 pieces Analog audio 2 channels (CH-1/CH-2 or CH-3/CH-4 can be selected from the sub LCD menu.) +4 dBm (standard) (when loaded with 600 Ω), low impedance, balanced
	HEADPHONES (Front panel)	Stereo phone jack Analog audio Adjustable up to –20 dBu (when loaded with 8 Ω), unbalanced

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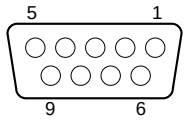
⑥ REMOTE (9P Female)

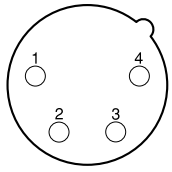
<external view>



Pin No.	Signal Name
1	GND
2	RM TX (–)
3	RM RX (+)
4	GND
5	NC
6	GND
7	RM TX (+)
8	RM RX (–)
9	GND

⑧ DC IN (4P Male)

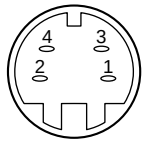
<external view>



Pin No.	Signal Name
1	GND
2	NC
3	NC
4	EXT DC

⑩ S VIDEO (4P)

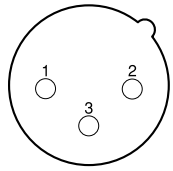
<external view>



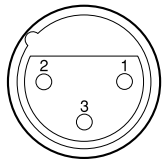
Pin No.	Signal Name
1	Y (G)
2	C (G)
3	Y (X)
4	C (X)

① AUDIO INPUT (3P Female)
⑭ AUDIO OUTPUT (3P Male)

<external view>



male

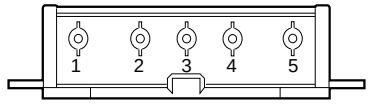


female

Pin No.	Signal Name
1	GND
2	X
3	Y

BATTERY IN (5P)

<external view>



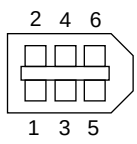
Pin No.	Signal Name
1	BATT (–)
2	BATT ID DET
3	BATT REM
4	LIGHT CONT
5	BATT (+)

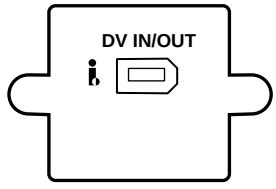
⑮ OPTIONAL PANEL

DSBK-140 (i.LINK (DV) Input/Output Board)
i.LINK (6-pin IEEE 1394, 1 peace)

Pin No.	Signal Name
1	VP
2	VG
3	TPB*
4	TPB
5	TPA*
6	TPA

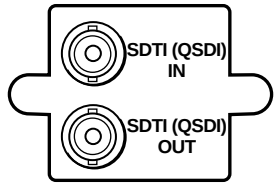
<external view>





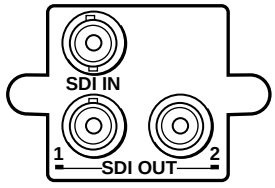
DSBK-150 (SDTI (QSDI) Input/Output Board)

SDTI (QSDI IN)	BNC, 1 piece SDT1 (QSD1) format (270 Mbps) SMPTE 305 M (for DSR-70)
SDTI (QSDI) OUT	BNC, 1 piece SDT1 (QSD1) format (270 Mbps) SMPTE 305 M (for DSR-70)



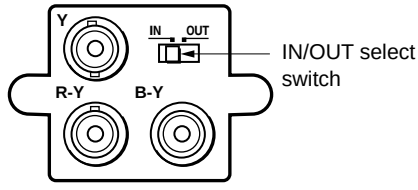
DSBK-160 (SDI Input/Output Board)

SDI IN	BNC, 1 piece Serial digital interface format (270 Mbps) SMPTE 259 M (for DSR-70) ITU-R BT.656 (for DSR-70P)
SDTI (QSDI) OUT	BNC, 2 pieces Serial digital interface format (270 Mbps) SMPTE 259 M (for DSR-70) ITU-R BT.656 (for DSR-70P)



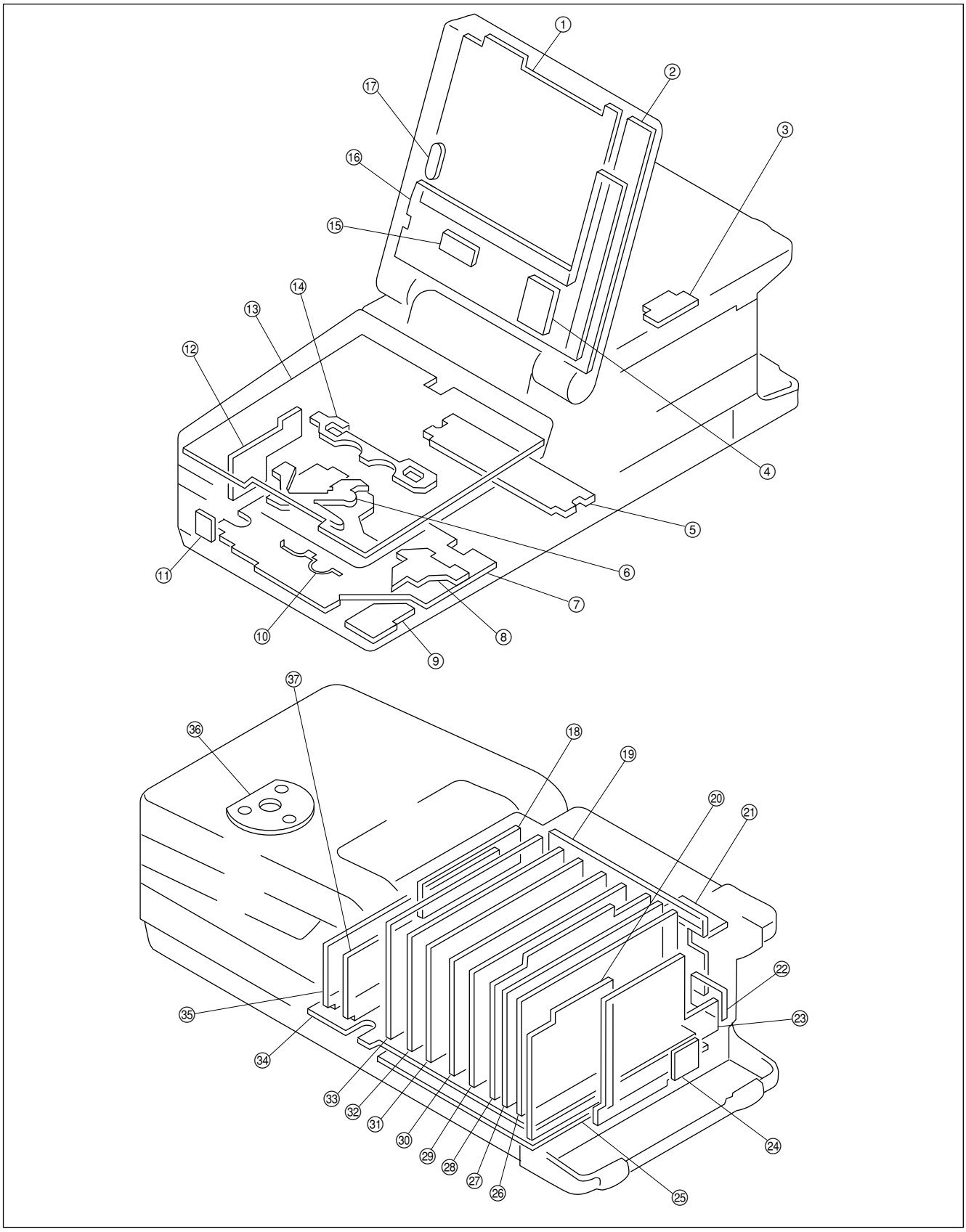
DSBK-170 (Analog Component Input/Output Board)

Y/R-Y/B-Y IN/OUT	BNC, 3 pieces With input/output selection switch Y: 1.0 Vp-p, 75 Ω, sync negative R-Y/B-Y: 0.7 Vp-p, 75 Ω (75 % color bar for DSR-70 or 100 % color bar for DSR-70P)



2-4. LOCATIONS OF MAIN PARTS AND CIRCUIT

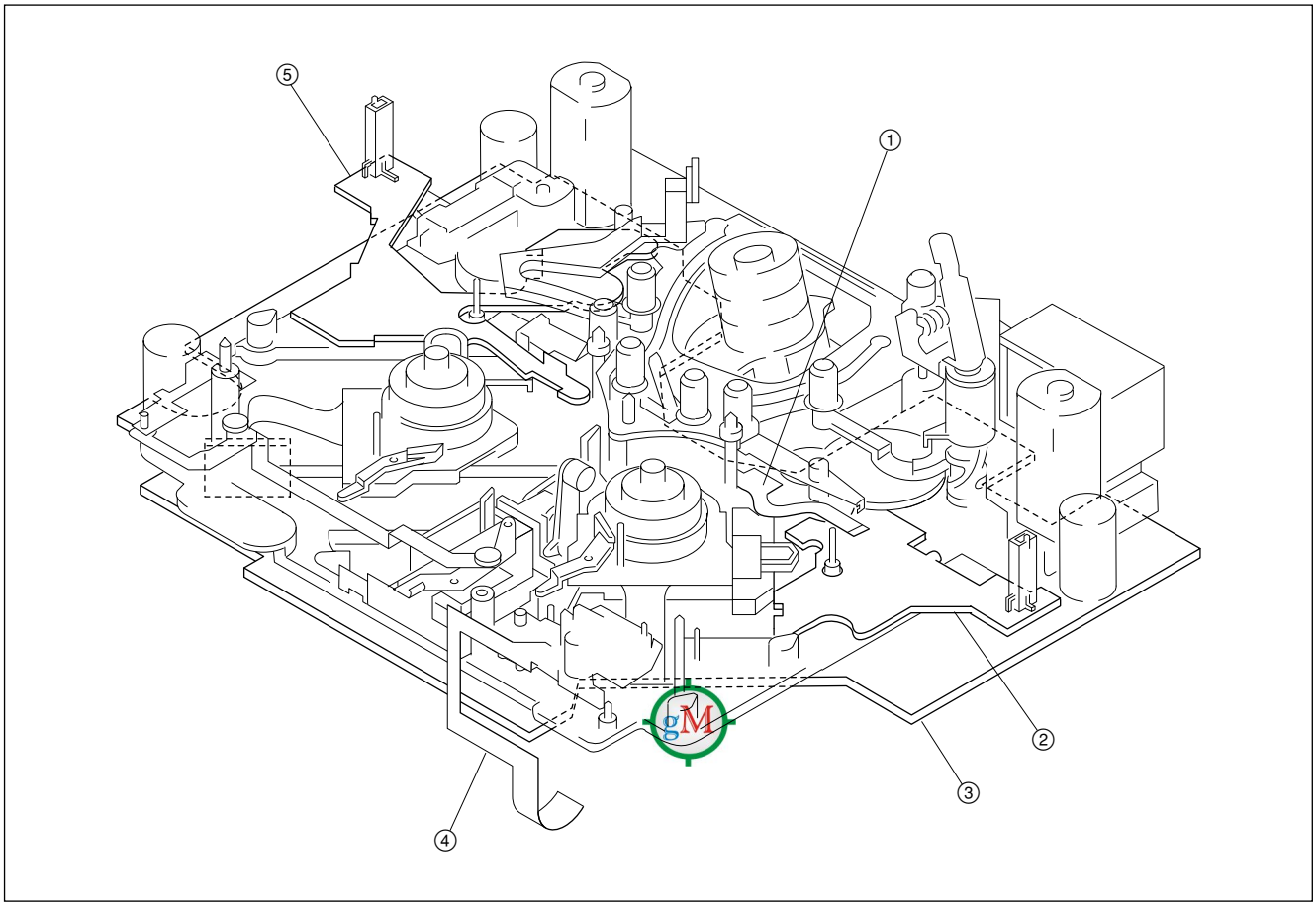
2-4-1. Printed Circuit Board Location Diagram and Circuit Configuration



System	Name of Circuit Board	Function	Fig.
Digital signal processing system	RPR-11/11P	Digital video/audio record processor	㉝
	PPR-11/11P DAP-21	Digital video/audio playback processor	㉛ ㊲
Video signal processing system	DDE-13	Analog video record processor	㉕
	DEN-11/11P/12/12P	Analog video playback processor	㉗/㉘
Audio system	AU-259	Audio A/D conversion (Analog CH1/2 Input), Audio D/A conversion (Analog CH1/2 or CH3/4 Output, Monitor Output)	㉖
RF processing system	RP-105	RF equalizer REC current control, PB EQ	㉟
System control	SY-269	System control	㉚
Servo control	SV-203	Servo control	㉙
Motor driver	DR-364	Servo control, Motor driver	⑦
Sensors	CC-79/80	Cassette compartment sensor	⑫/⑭
	SE-462	Tension/Loading/Tape end sensor	⑥
	SE-463	Reel position/Tape top sensor	⑧
	SE-464	TOP/END LED	⑩
Control panel	KY-433	Panel control	⑬
	SE-454	JOG/SHUTTLE	㊱
Display panel	DP-281	Display panel control	⑯
	DP-283	LCD for audio meter	④
	DP-290	Display panel control (for color LCD)	①
	CN-1675	Relay board (Connecting the color LCD with the DP-290 board)	⑰
	CN-1676	Relay board (Connecting the sub LCD with the DP-281 board)	⑮
	Inverter	Inverter for color LCD	②
Connector panel	CP-325	Connector board (VIDEO Input/Output, REF Input/Output, S-VIDEO Input/Output, MONITOR Output, TC Input/Output, REMOTE)	㉓
	CP-326	Connector board (AUDIO Input/Output)	⑳
	DC-97	DC IN connector board	㉒
Power supply	RE-158	Circuit breaker	㉑
	RE-159	Switching regulator	⑲
Others	MB-804	Mother board	㉞
	CN-1666	Relay board (Connecting the top frame with the MB-804 board, etc.)	⑱
	FL-256	Battery terminal board	③
	HP-92	Headphones jack	⑨
	PSW-65	POWER switch	⑪
Options	DV-19 (DSBK-140)	i.LINK (DV) Input/Output Board	㉜
	CN-1696 (DSBK-140)	i.LINK (DV) Input/Output Board	㉔
	SDI-39 (DSBK-150)	SDTI (QSDI) Input/Output Board	㉔ ㉜
	SDI-38 (DSBK-160)	SDI Input/Output Board	㉔ ㉜
	CP-338 (DSBK-170)	Analog Component Input/Output Board	㉔
	PP-55 (DSBK-180/180P)	Dual Video Input Board	⑤

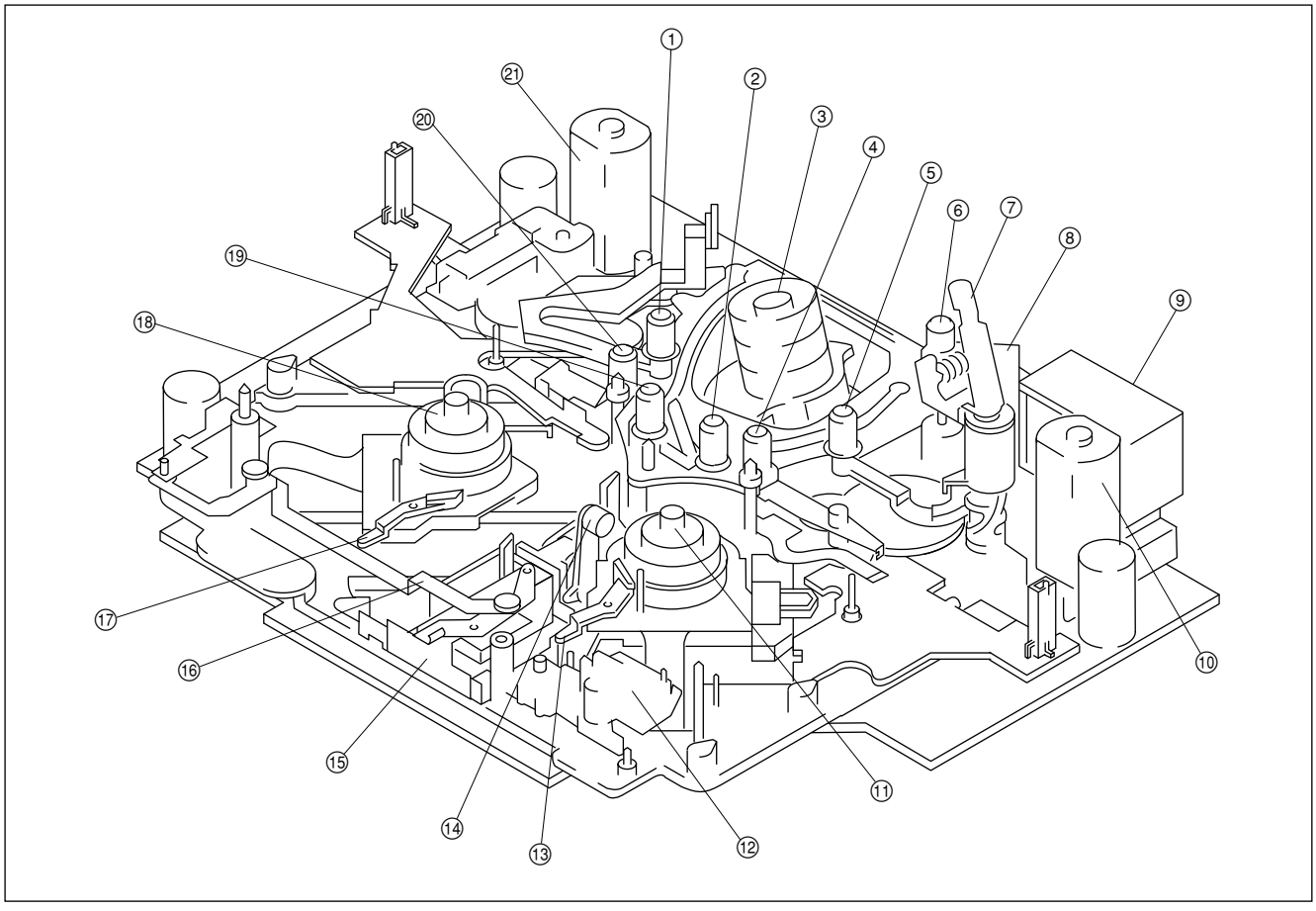
2-4-2. Main Mechanical Parts

Circuit Board Locations on Mechanism Block



	Board Name	Circuit Structure
①	SE-464 board	Tape TOP/END LED
②	SE-463 board	Tape TOP Sensor, Reel Position Sensor, Thermo-sensor
③	DR-364 board	Servo Sub Control, Drum/Capstan/Reel/Reel-shift/Loading Motor Drive, Drum FG/PG Shaper, Capstan/Reel FG Shaper, Solenoid Drive, TOP/END Sensor AMP, Loading Sensor AMP, S-tension AMP
④	CN-1681 board	MIC/REC-inhibit Signal
⑤	SE-462 board	Tape END Sensor, S-tension Sensor, Loading Sensor, Loading FG Sensor

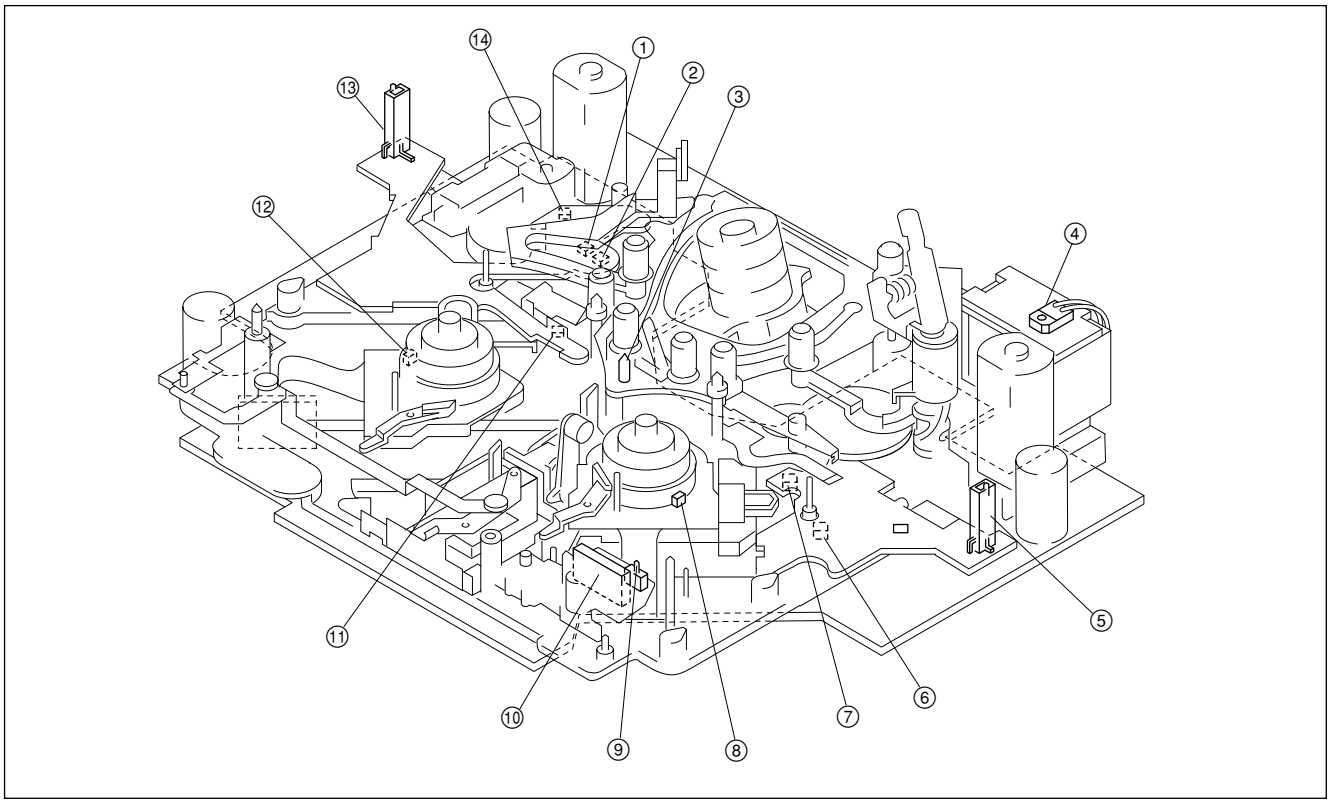
Locations of Main Parts



① S4 Arm
② Shuttle Assembly (R)
③ Drum Assembly
④ T Drawer Arm
⑤ T4 Arm
⑥ Capstan Motor
⑦ Pinch Roller Arm Assembly
⑧ Pinch Pressure Assembly
⑨ Pinch Solenoid Plunger
⑩ DC Motor (Reel Shift Motor)
⑪ DC Motor SRD12A/J-RP (Reel Motor (T))
⑫ MIC Assembly
⑬ Brake Assembly (T)
⑭ RLR Claw Assembly
⑮ Brake Drive Assembly
⑯ Open Arm Assembly
⑰ Brake Assembly (S)
⑱ DC Motor SRD13A/J-RP (Reel Motor (S))
⑲ Shuttle Assembly (L)
⑳ Tension Regulator Arm
㉑ DC Motor (Threading Motor)

2-4-3. Locations and Functions of Sensors

Sensor Location Diagram (1) ..... Mechanism Deck



①, ② Mode sensor
Detects the mechanism position during threading.

③ Tape top/end detect LED
Detects the top and end of a tape.

④ Condensation sensor
Detects condensation accumulated in the DSR-70/70P.

⑤ Tape top sensor
Detects the top of a tape that runs in the REV direction.

⑥ Reel position sensor (Standard reel position)
When the inserted cassette tape is a standard size, this sensor detects if the reel table is positioned at the specified standard reel position.

⑦ Reel position sensor (Small reel position)
When the inserted cassette tape is a small size, this sensor detects if the reel table is positioned at the specified small reel position.

⑧ Reel FG sensor (Takeup side)
Detects rotation of the takeup reel table. The FG output of the sensor is sent to the servo circuit and used to control the rotating speed and torque of the reel motor.

⑨ Record proof sensor (common to standard and mini size cassettes)
Protects tape from mis-recording.

⑩ Cassette memory termination
Determines whether cassette memory is used, and reads and writes data to and from cassette memory.

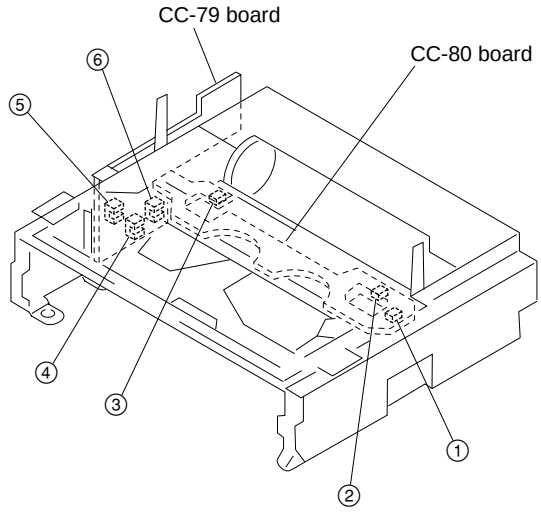
⑪ Tension sensor
The tension arm keeps the tension of a running tape constant during recording and playing. The tension sensor detects the mechanical position of the tension arm.

⑫ Reel FG sensor (Supply side)
Detects the rotation of the supply reel table. The PG output of the sensor is input to the servo circuit and controls the rotating speed and torque of the reel motor.

⑬ Tape end sensor
Detects the end of a tape that runs in the FWD direction.

⑭ Threading motor FG sensor
Detects the rotation speed of the gear box motor. The FG output of the sensor is input to the servo circuit and controls the threading speed so that excessive force is not applied to the tape during threading.

Sensor Location Diagram (2) .... Cassette compartment

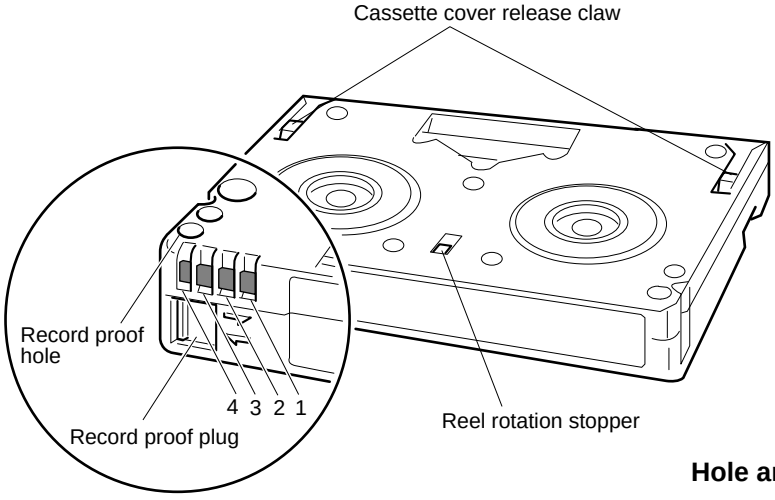


① Standard cassette right side IN-sensor
② Mini cassette right side IN-sensor
③ Standard and mini cassettes left side IN-sensor
Insertion of a standard cassette is detected by the combination of sensors ① and ③.
Insertion of a mini cassette is detected by the combination of sensors ② and ③.

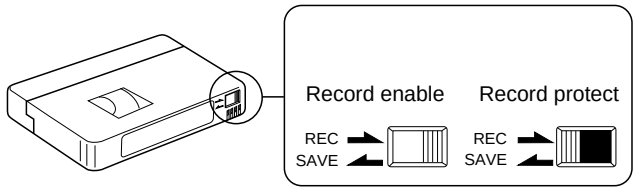
④, ⑤, ⑥ Cassette DOWN sensor
Moving up-and-down of the cassette compartment is detected by the combination of sensors ④, ⑤ and ⑥.

2-5. FUNCTIONS OF RECORD PROOF HOLE AND RECORD PROOF PLUG OF CASSETTE

Standard cassette

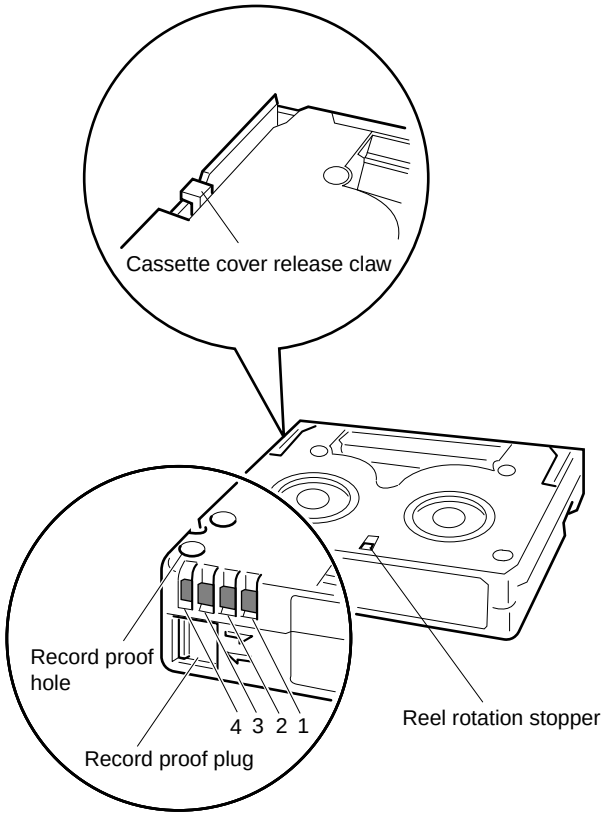


Hole and plug for record proof



- This plug controls the record proof switch according to open or close position.

Mini cassette



Pin No.	Function	
	Equipped with built-in memory	**Not equipped with built-in memory**
1	+DC	Detecting tape thickness
2	DATA	Detecting tape type (Example: ME/MP)
3	CLOCK	Detecting tape application (Example: consumer/professional)
4	GND	–

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2-6. REMOVAL AND ATTACHMENT OF CABINETS

2-6-1. Battery Panel Assembly

1. Push the lock lever in the direction of arrow **A**, and remove the battery cover in the direction of the arrow.
2. Loosen fully the four screws.
   Note : These screws have drop-safe washers. Do not remove the screws.

3. Open the battery panel assembly, disconnect the connector (CN1) from the RE-159 board, and remove the battery panel assembly.

Note when re-attaching the panel :
Route the harness coming from the battery panel assembly in between the DEN-12/12P and SV-203 boards while taking care not to force the harness over the board lever.

4. Attach the battery panel assembly by reversing the removal procedure.

2-6-2. Top Frame Assembly

1. Remove the battery panel assembly. (Refer to section 2-6-1, steps 1 to 3.)
2. Move the lock lever of the LCD panel in the direction of arrow **B**, and open the LCD panel block in the direction of arrow **C**.
3. Push the lock release lever of the control panel with a flat head screwdriver (−3 mm) in the direction of the arrow, and open the control panel in the direction of arrow **D**.
4. Push the lock arm from inside in the direction of arrow **E**, and open the control panel in the direction of arrow **D**.
5. Loosen fully the four screws.
   Note : These screws have drop-safe washers. Do not remove the screws.

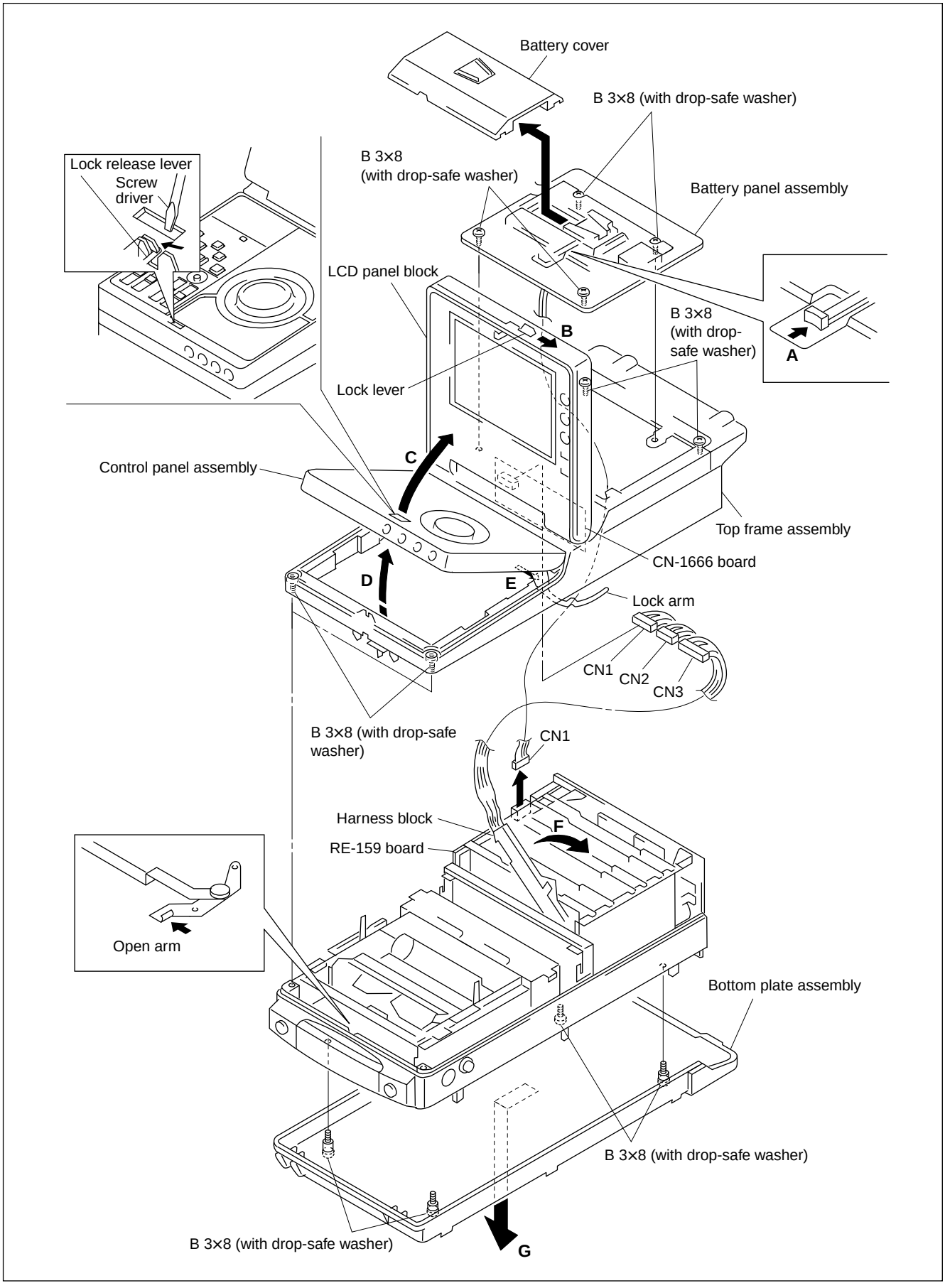
6. While raising the top frame assembly, remove slowly the harness block in the direction of arrow **F** and remove the three connectors (CN1, CN2 and CN3) from the CN-1666 board.
7. Remove the top frame assembly.

Note when re-attaching the panel back :
- Attach the top frame assembly while confirming that the open arm position has been moved fully in the direction of the arrow so that the release lever of the top frame assembly does not interfere with the open arm of the mechanism chassis assembly.
- Attach the top frame assembly while taking care not to pinch the harness.

8. Attach the top frame assembly by reversing the removal procedure.

2-6-3. Bottom Plate Assembly

1. Loosen fully the four screws, and remove the bottom plate assembly in the direction of arrow G while taking care of the front switch.
   Note : These screws have drop-safe washers. Do not remove the screws.

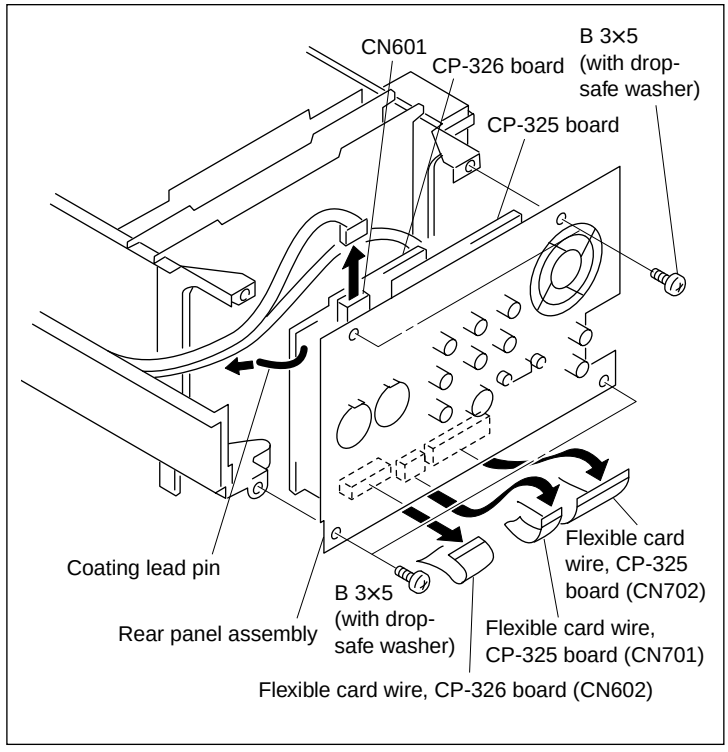

Battery cover
B 3×8 (with drop-safe washer)
B 3×8
(with drop-safe washer)
Battery panel assembly
Lock release lever
Screw
driver
LCD panel block
B
B 3×8
(with drop-
safe washer)
A
Lock lever
C
Control panel assembly
Top frame assembly
CN-1666 board
D
E
Lock arm
CN1
CN2
CN3
B 3×8 (with drop-safe
washer)
CN1
Harness block
F
RE-159 board
Open arm
Bottom plate assembly
B 3×8 (with drop-safe washer)
B 3×8 (with drop-safe washer)
G

2-6-4. Rear Panel Assembly

1. Remove the battery panel assembly, top frame assembly, and bottom plate assembly. (Refer to sections 2-6-1 to 2-6-3.)
2. Remove the two flexible card wires (CN701, CN702) from the CP-325 board and the flexible card wire (CN602) from the CP-326 board.
3. Remove the four screws, and remove the rear panel assembly.
4. Remove the harness from the coating lead pin on the CP-326 board, and remove the connector (CN601) from the CP-326 board.

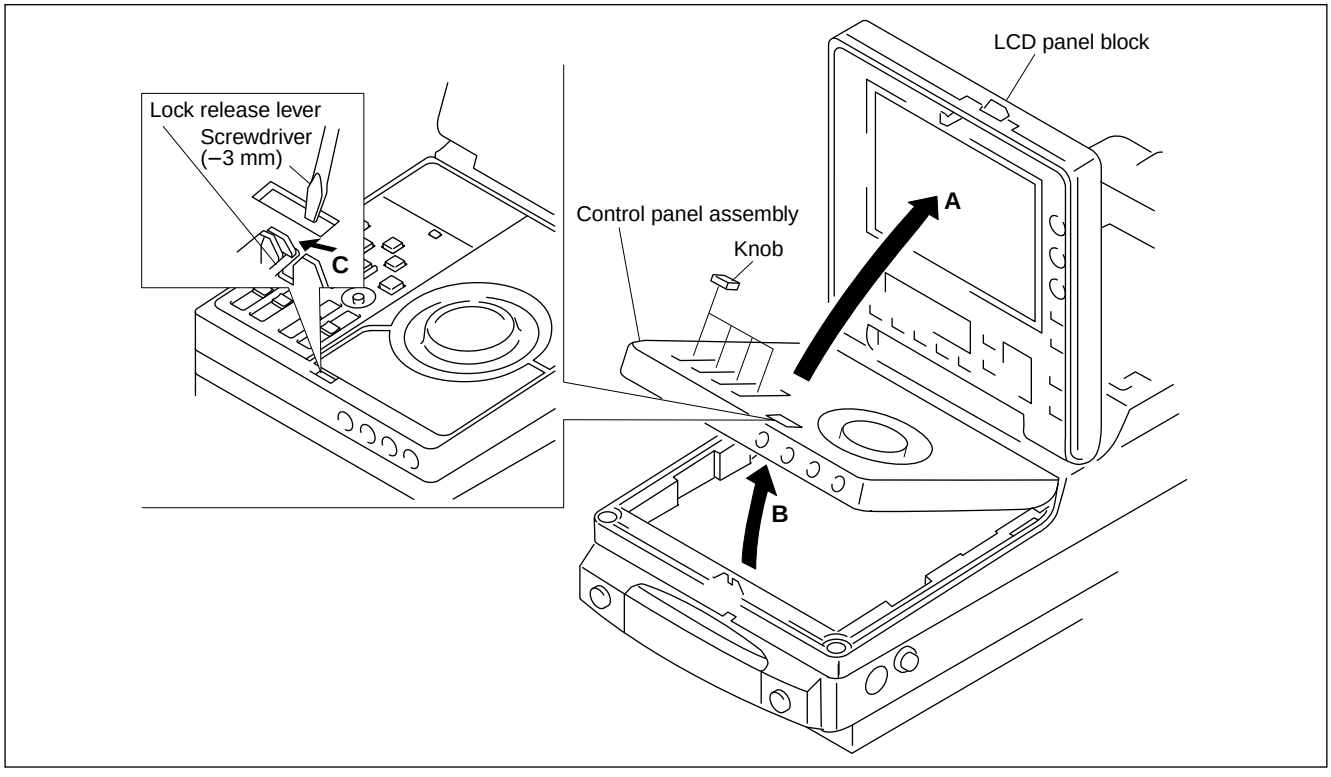
Note when re-attaching the panel :
Route the harness that is fixed by the coating lead pin, in between the rear panel assembly and the CP-326 board.

5. Attach the rear panel assembly by reversing the removal procedure.

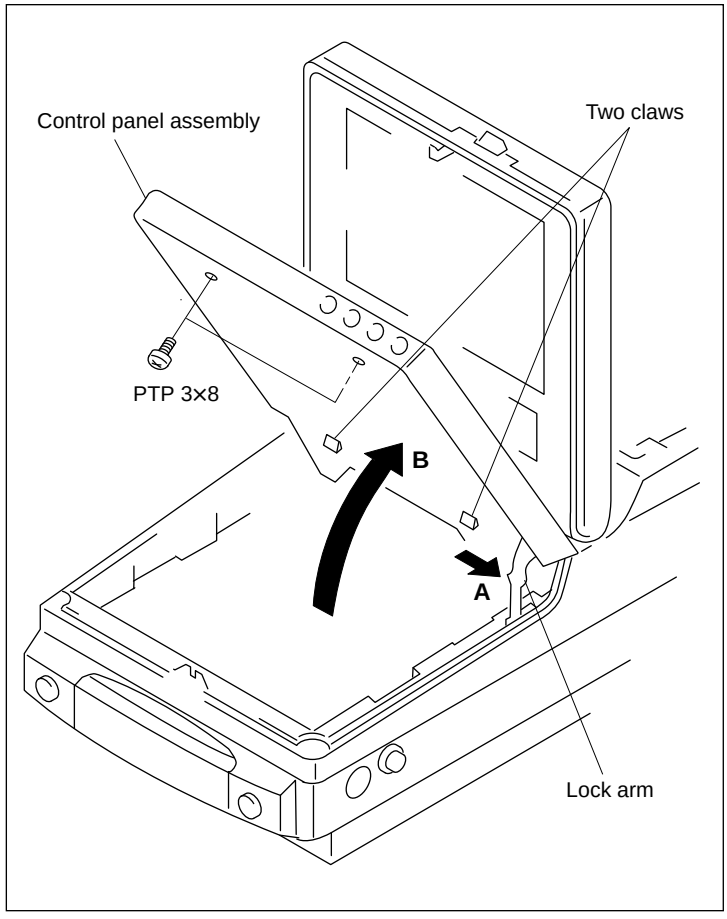


2-6-5. Control Panel Assembly

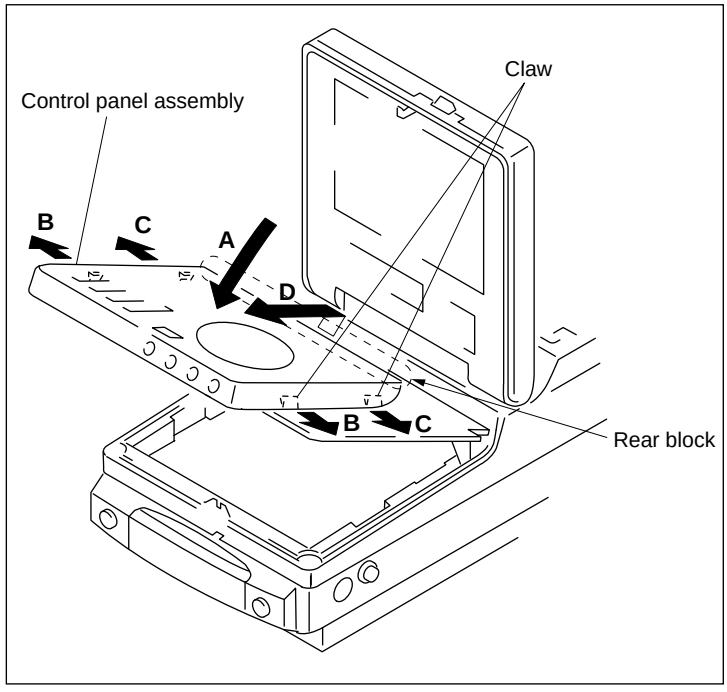
1. Open the LCD panel block in the direction of arrow **A**. (Refer to section 2-6-2, step 2.)
2. Pull the four knobs out.
3. Push in the lock release lever of the control panel assembly with a flat head screwdriver (−3 mm) in the direction of arrow **C**, and open the control panel in the direction of arrow **B**.



4. While pushing the lock arm slightly with your fingers in the direction of arrow **A**, open the control panel assembly in the direction of arrow **B**.
5. Remove the two screws, and release the two claws of the control panel assembly.



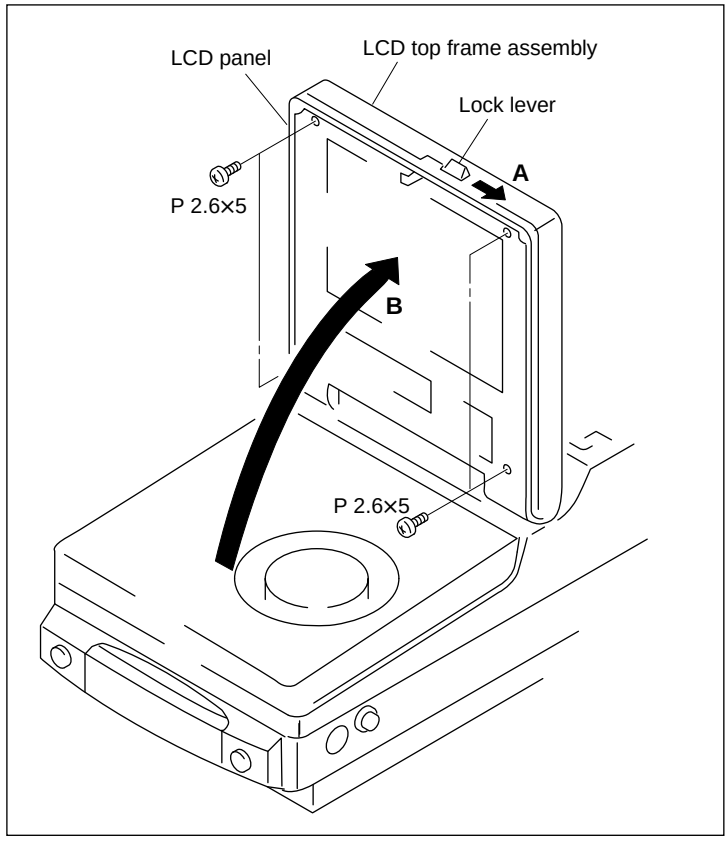
6. Close the control panel assembly halfway in the direction of arrow **A**, and open the claws in the direction of arrows **B** and **C**. Raise up the rear of the control panel assembly and remove the control panel assembly in the direction of arrow **D**.
7. Attach the control panel assembly by reversing the removal procedure.



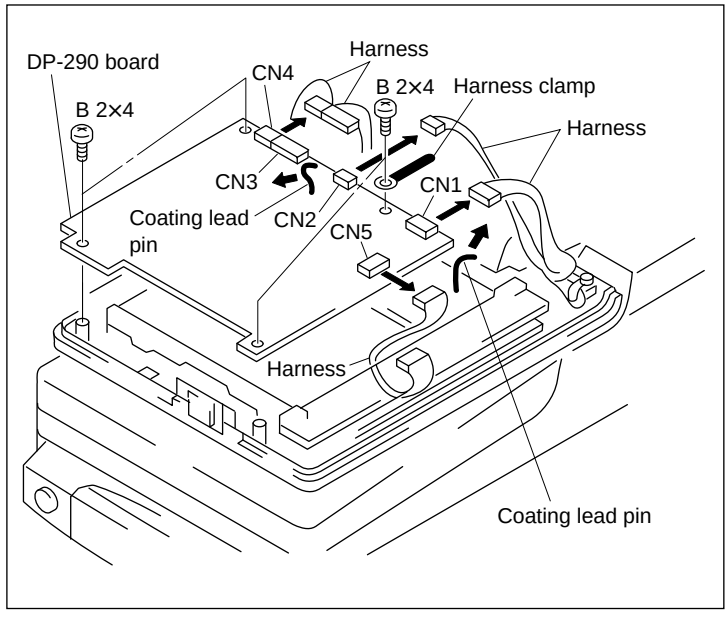
2-7. REPLACEMENT OF MAIN PARTS

2-7-1. Back Light

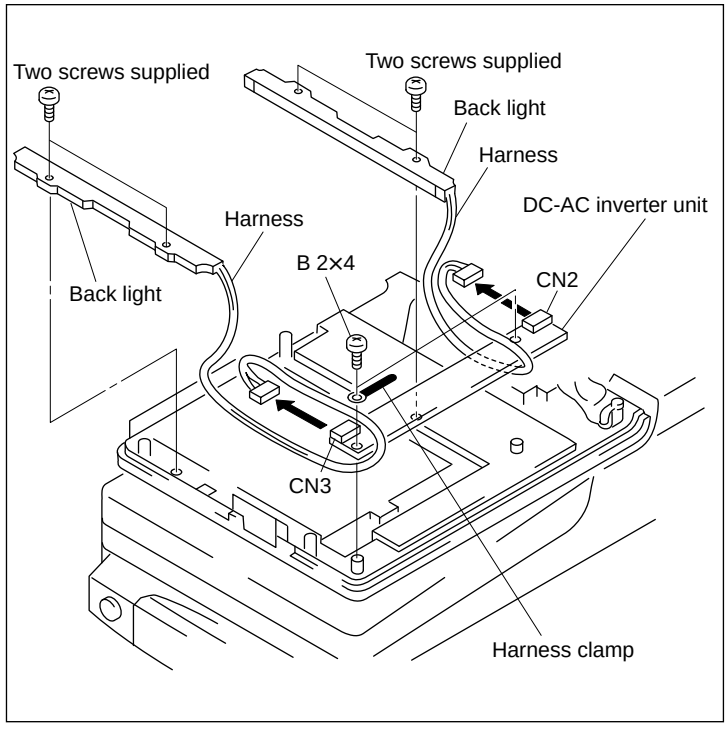
1. Push the lock lever in the direction of arrow **A**, and open the LCD panel in the direction of arrow **B**. Remove the four screws from the LCD panel and tilt the LCD panel up to the original position. Remove the LCD top frame assembly.



2. Remove the harness from the two coating lead pins and from the harness clamp respectively. Remove the harness from the five connectors (CN1, CN2, CN3, CN4 and CN5) on the DP-290 board.
3. Remove the four screws and remove the DP-290 board.

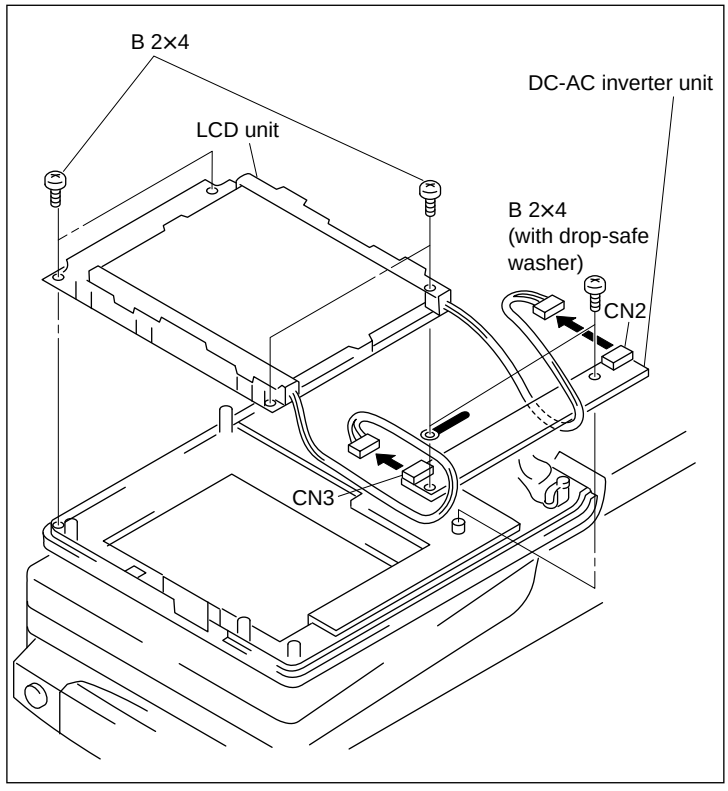


4. Remove the harness from the harness clamp.
5. Remove the two connectors (CN2, CN3) from the DC-AC inverter unit.
6. Remove the two screws and remove the DC-AC inverter unit.
7. Remove the two screws from each of the two back lights, and remove the back light.
8. Attach the back lights by reversing the removal procedure.



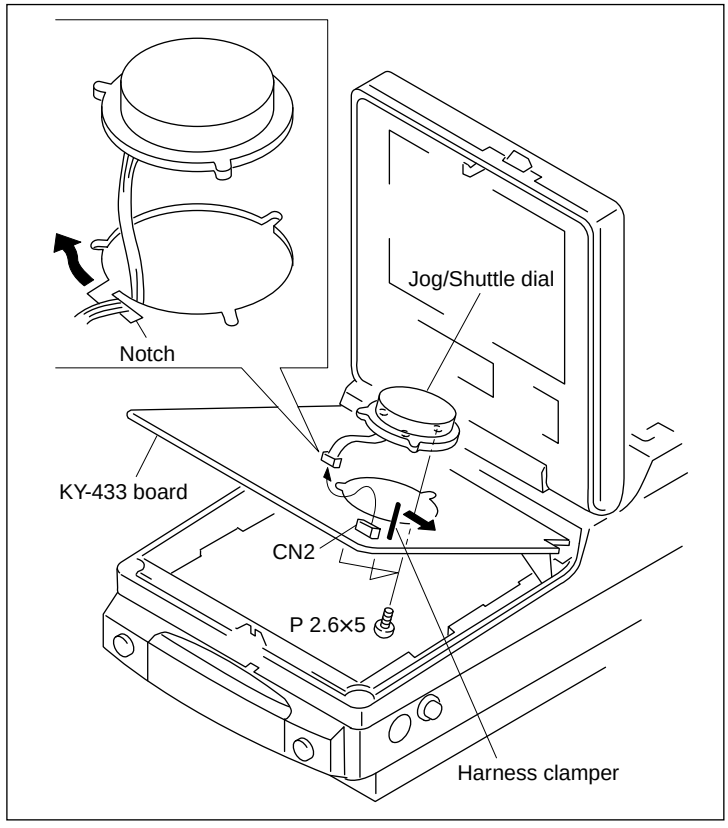
2-7-2. LCD Unit

1. Remove the LCD top frame assembly and the DP-290 board. (Refer to section 2-7-1, steps 1 and 2.)
2. Remove the two connectors (CN2, CN3) from the DC-AC inverter unit.
3. Remove the two screws from the DC-AC inverter unit, and remove the DC-AC inverter unit.
4. Remove the four screws, and remove the LCD unit.
5. Attach the LCD unit by reversing the removal procedure.



2-7-3. Jog/Shuttle Dial

1. Remove the control panel. (Refer to section 2-6-5.)
2. Remove the harness clamper, and remove the connector (CN2) from the KY-433 board.
3. Remove the three screws.
4. Remove the harness from the notch and remove the jog/shuttle dial.
5. Attach the jog/shuttle dial by reversing the removal procedure.



2-7-4. Cassette Compartment Assembly

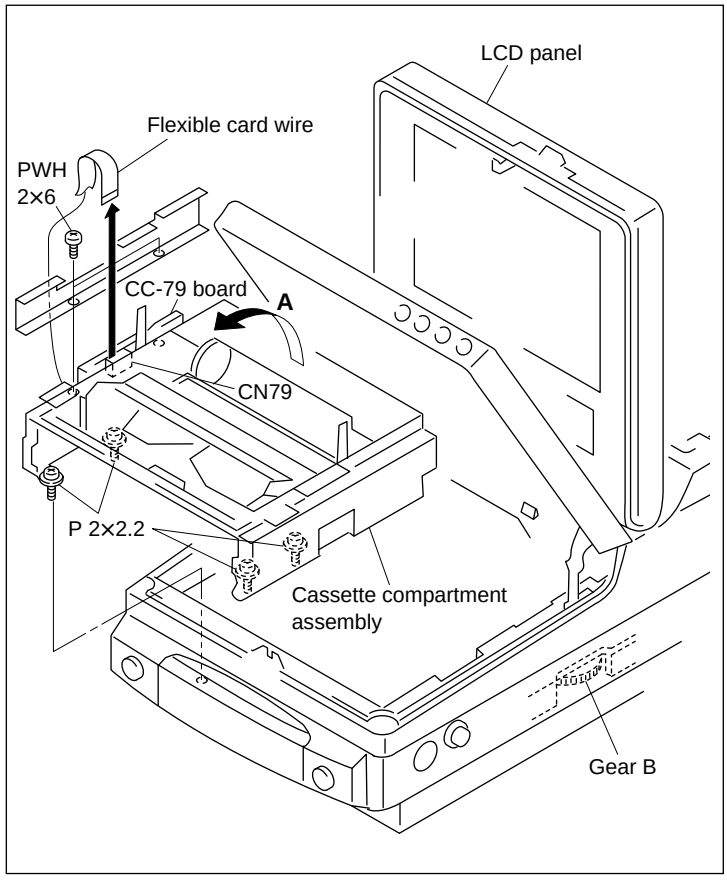
Note : Be sure to turn off the main power before removing any parts other than the specified parts. The IC link (PS302/MB-804 board) may be damaged if the electrode surface of the flexible card wire is short-circuited.

Tool

Grease (SGL-505 (20 g)) : 7-662-010-04

Removal

1. Confirm that the DSR-70/70P is in the unthreaded-end state.
2. Open the LCD panel.
   (Refer to section 2-6-2, step 2.)
3. Open the control panel.
   (Refer to section 2-6-5, step 3.)
4. Remove the cover L.
5. Remove one flexible card wire (CN79) from the CC-79 board.
6. Loosen fully the four screws and remove the cassette compartment assembly in the direction of arrow **A**.



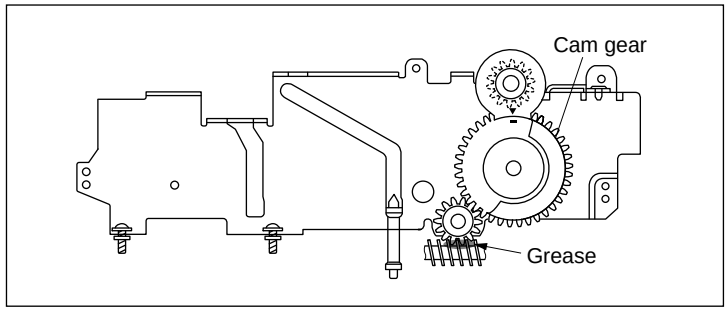
Note :
- **These screws have drop-safe washers. Do not remove the screws.**
- **Move the reel tables to the mini cassette position before starting to remove and attach the cassette compartment assembly in order to protect the MIC terminal.**

Attaching procedure

1. Coat the ▬ area with grease.
   (Refer to section 6-1-3, “Grease”.)
2. With the cassette compartment assembly removed, turn on the main power of the DSR-70/70P. (This rotates the threading motor automatically and sets the gear phase of the mechanism deck.) Be careful not to short-circuit the terminal of the removed flexible card wire with the chassis.
3. Align the gear phase of the cassette compartment to the specified position as shown in the figure by turning the cam gear.

   Specification :

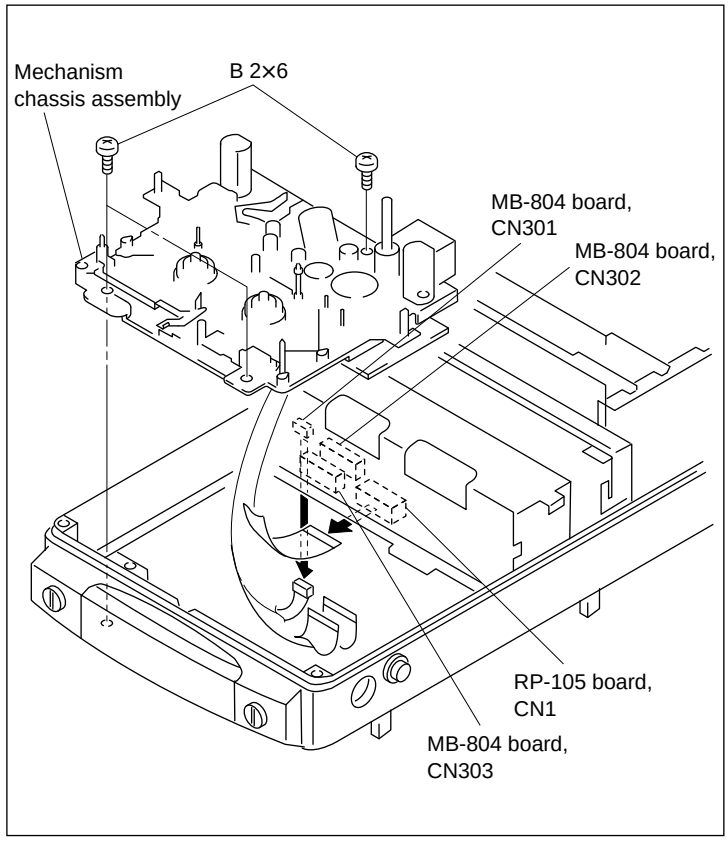
   The reverse triangle ▼ mark is positioned within the square marked ■ region.



4. Attach the cassette compartment assembly by reversing the removal procedure.

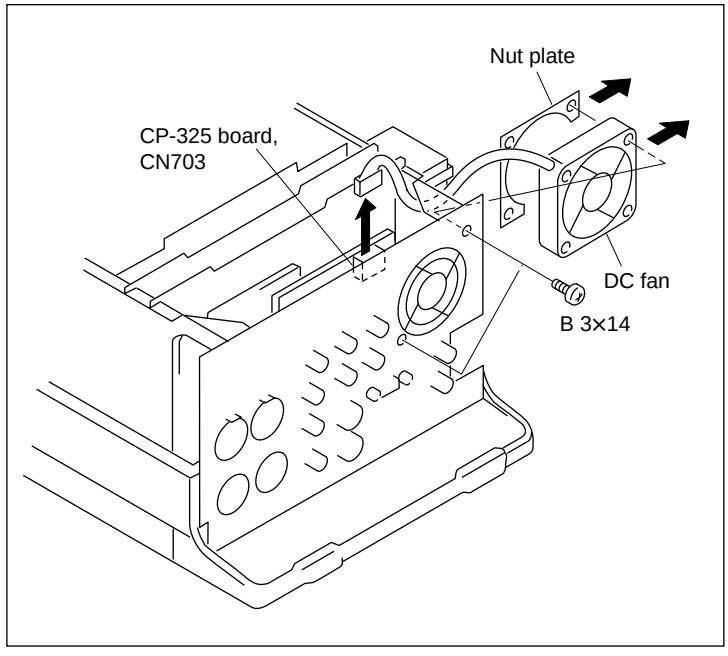
2-7-5. Mechanism Chassis Assembly

1. Remove the top frame assembly, bottom plate assembly, and cassette compartment assembly. (Refer to sections 2-6-1 to 2-6-3, and 2-7-4.)
2. Remove the two flexible card wires (CN302, CN303) and one connector (CN301) from the MB-804 board, and remove the flexible card wire (CN1) from the RP-105 board.
3. Remove the three screws, and remove the mechanism chassis assembly.
4. Attach the mechanism chassis assembly by reversing the removal procedure.



2-7-6. DC Fan

1. Remove the battery panel assembly and top frame assembly. (Refer to sections 2-6-1 and 2-6-2.)
2. Remove the connector (CN703) from the CP-325 board.
3. Remove the two screws, and remove the nut plate and DC fan.
4. Attach the DC fan by reversing the removal procedure.



2-8. REMOVAL AND ATTACHMENT OF THE CIRCUIT BOARDS

2-8-1. Plug-in Boards

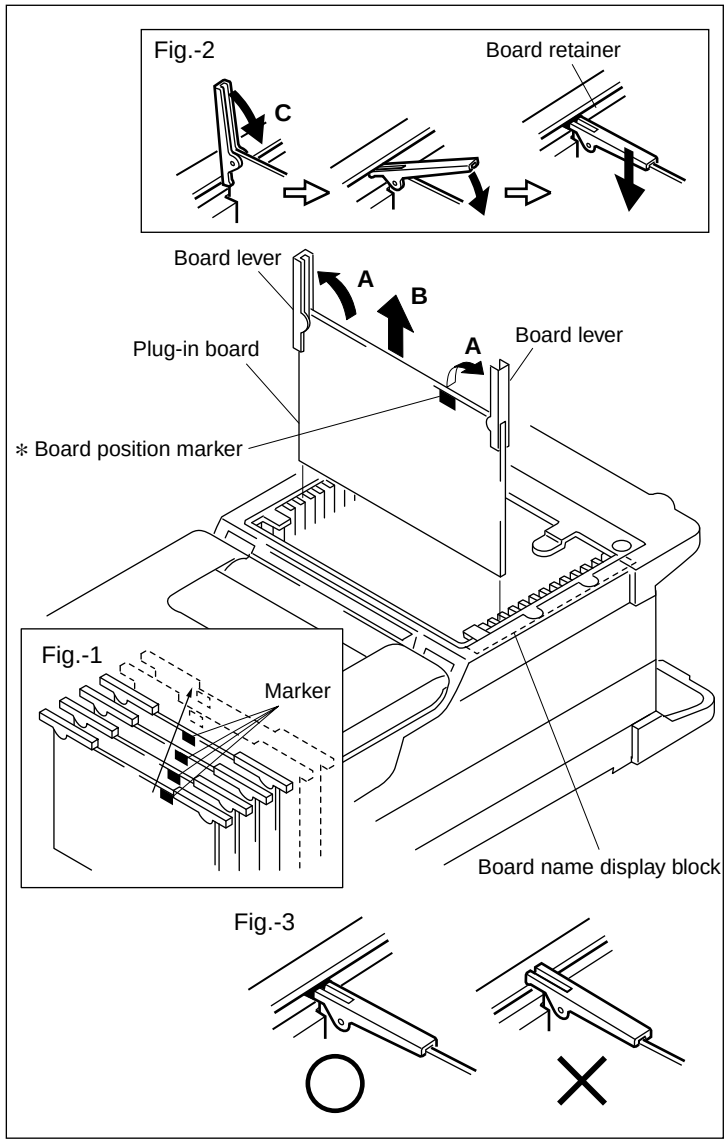
1. Remove the battery panel assembly.
   (Refer to section 2-6-1.)
2. Raise up the board lever in the direction of arrow **A**, and pull out the board in the direction of arrow **B**.

Note when installing the board :

- Insert the plug-in board completely until it is securely inserted into the mother board connector.
- When the boards are installed, the board position markers must be aligned to form a line as shown in Fig.-1.

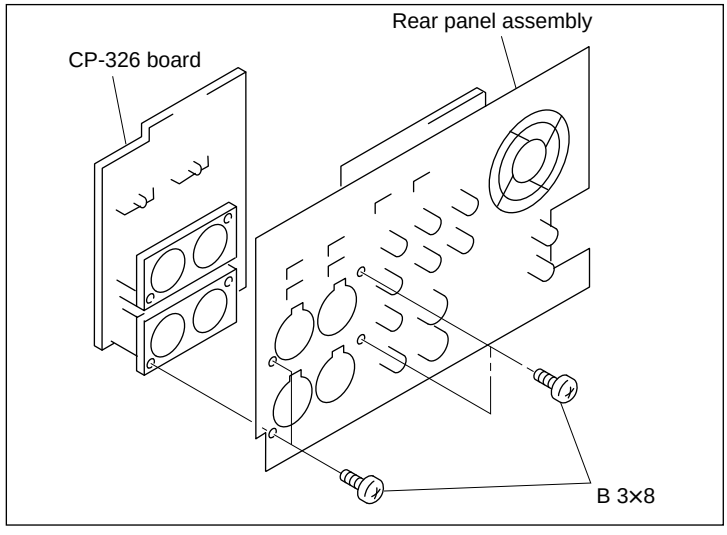
3. Before installing the boards, confirm that the plug-in board matches the board name indication as shown, then insert the board along the board guide rail.
4. Fold down the board lever in the direction of arrow **C** in Fig.-2.

Note : The board lever may not be fitted into the DSR-70/70P depending on the timing of folding down the lever.
If the board lever remains in the state as shown in Fig.-3, the battery panel assembly of the DSR-70/70P cannot be closed.
Before attaching the battery panel assembly, confirm that the board lever is folded down and fixed completely in the DSR-70/70P.



2-8-2. CP-326 BOARD

1. Remove the rear panel assembly.
   (Refer to section 2-6-4.)
2. Remove the four screws, and remove the CP-326 board.
3. Attach the CP-326 board by reversing the removal procedure.



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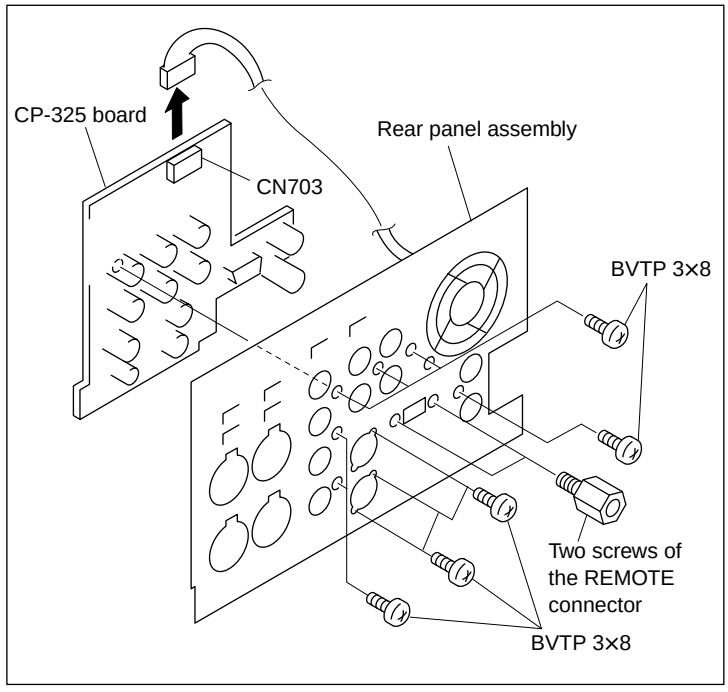
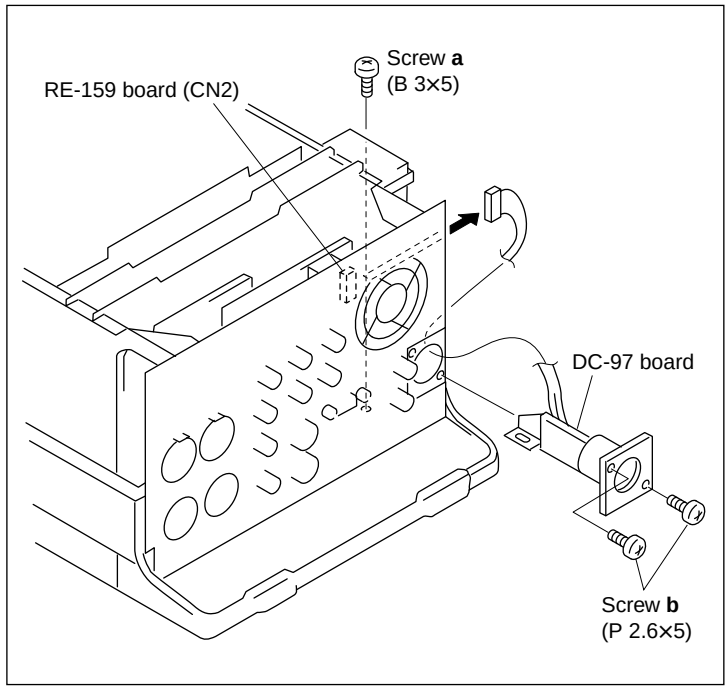
2-8-3. CP-325 Board

1. Remove the rear panel assembly. (Refer to section 2-6-4.)
2. Remove the CP-326 board. (Refer to section 2-8-2.)
3. Remove the connector (CN703) from the CP-325 board.
4. Remove the two screws from the REMOTE connector.
5. Remove the ten screws, and remove the CP-325 board.
6. Attach the CP-325 board by reversing the removal procedure.



2-8-4. DC-97 Board

1. Remove the battery panel assembly and top frame assembly. (Refer to sections 2-6-1 and 2-6-2.)
2. Remove the connector (CN2) from the RE-159 board.
3. Loosen the screw "**a**" and remove the two screws "**b**", then remove the DC-97 board.
4. Attach the DC-97 board by reversing the removal procedure.



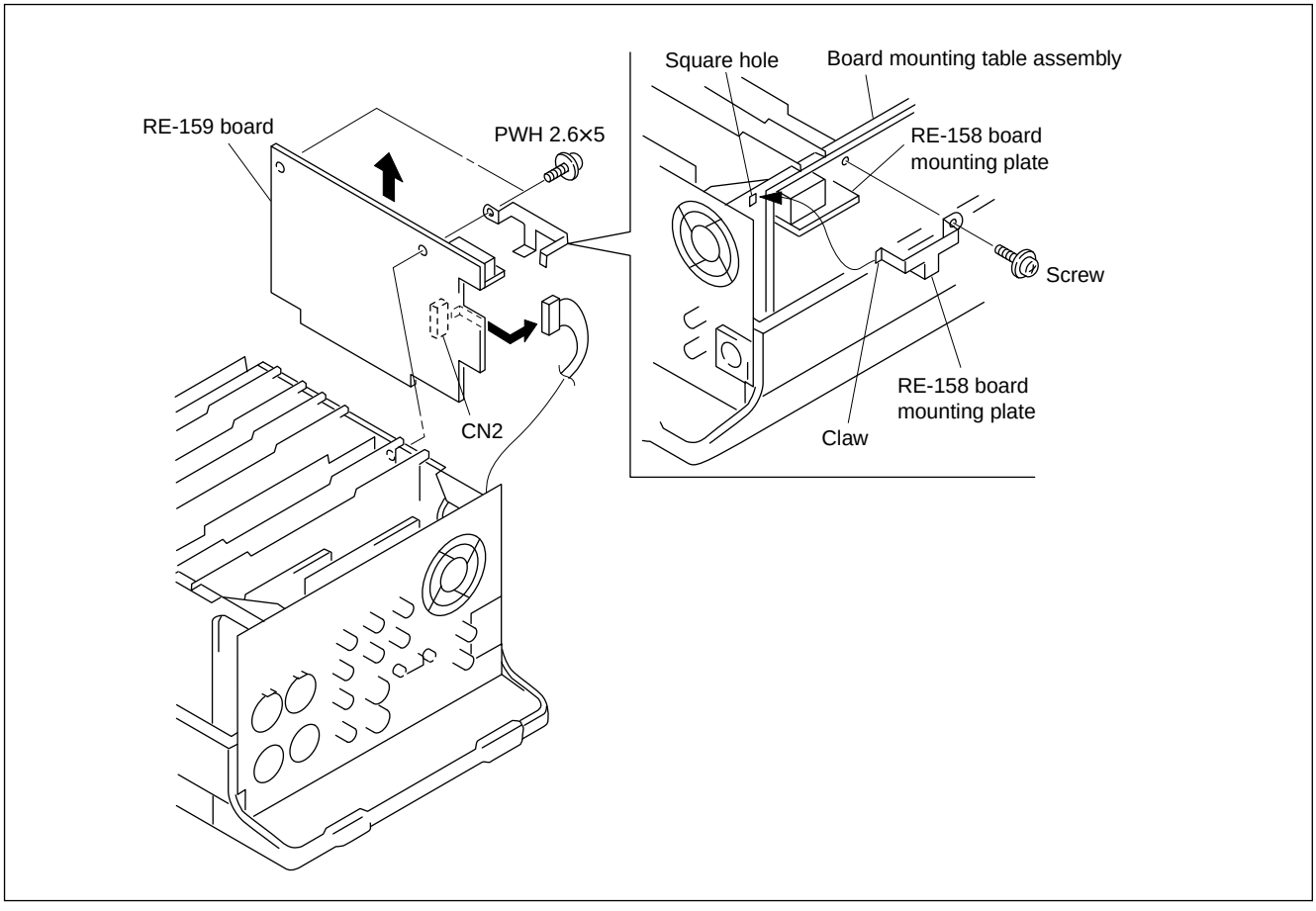
2-8-5. RE-159 Board

1. Remove the battery panel assembly and top frame assembly. (Refer to sections 2-6-1 and 2-6-2.)
2. Remove the connector (CN2) from the RE-159 board.
3. Remove the two screws, and remove the RE-159 board straight up.

Note when installing the board :

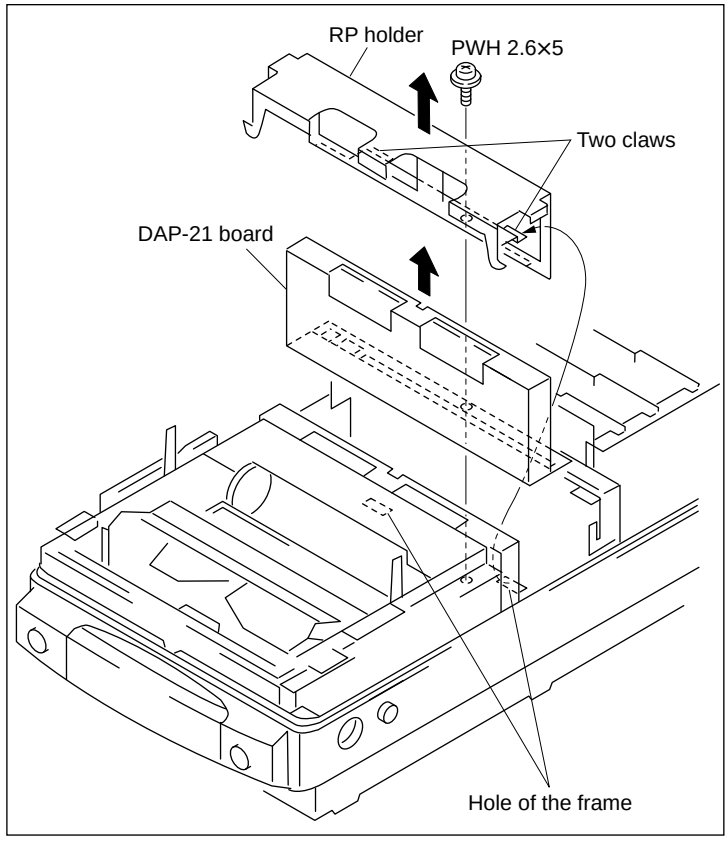
Insert the claw of the RE-158 board mounting plate into the square hole of the board mounting table assembly. Tighten the screw as shown in the figure.

4. Attach the RE-159 board by reversing the removal procedure.



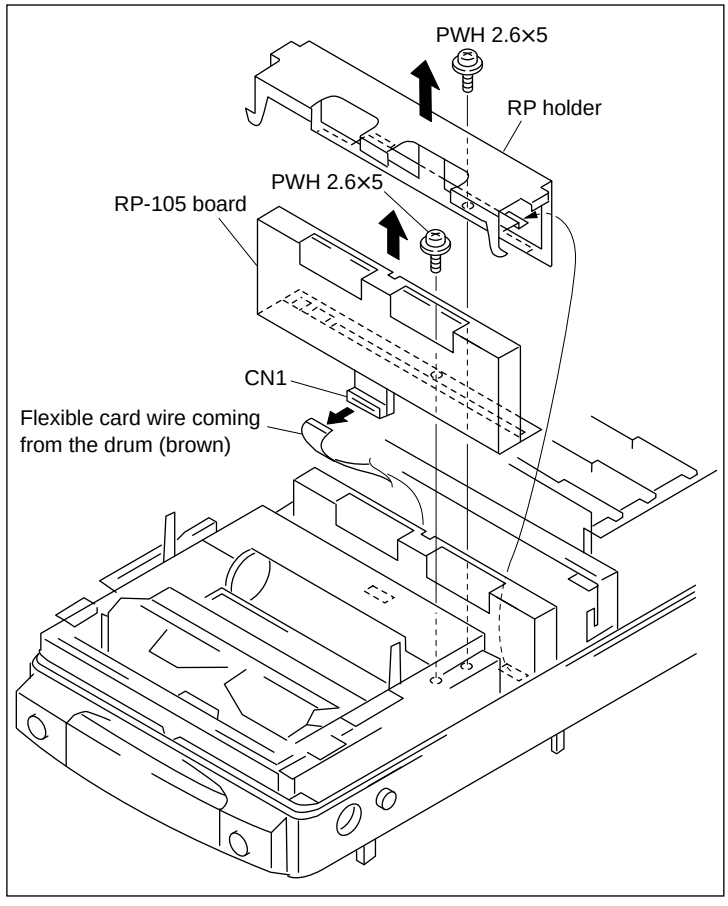
2-8-6. DAP-21 Board

1. Remove the battery panel assembly and top frame assembly. (Refer to sections 2-6-1 and 2-6-2.)
2. Remove the screw and remove the two claws of the RP holder from the hole of the frame. Raise the RP holder.
3. Remove the DAP-21 board straight up.
4. Attach the DAP-21 board by reversing the removal procedure.



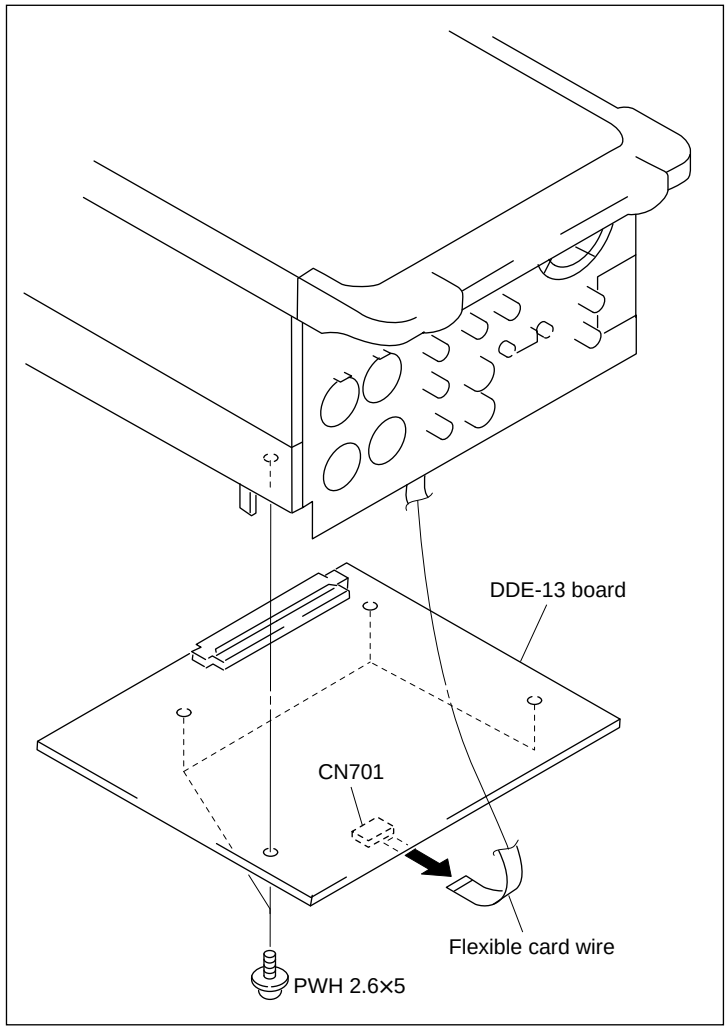
2-8-7. RP-105 Board

1. Remove the bottom plate assembly. (Refer to section 2-6-3.)
2. Remove the flexible card wire (brown) that comes from the drum, from the connector (CN1) on the RP-105 board.
3. Remove the battery panel assembly and top frame assembly. (Refer to sections 2-6-1 and 2-6-2.)
4. Remove the screw and remove the two claws of the RP holder from the hole of the frame. Raise the RP holder.
5. Remove the screw, and remove the RP-105 board straight up.
6. Attach the RP-105 board by reversing the removal procedure.



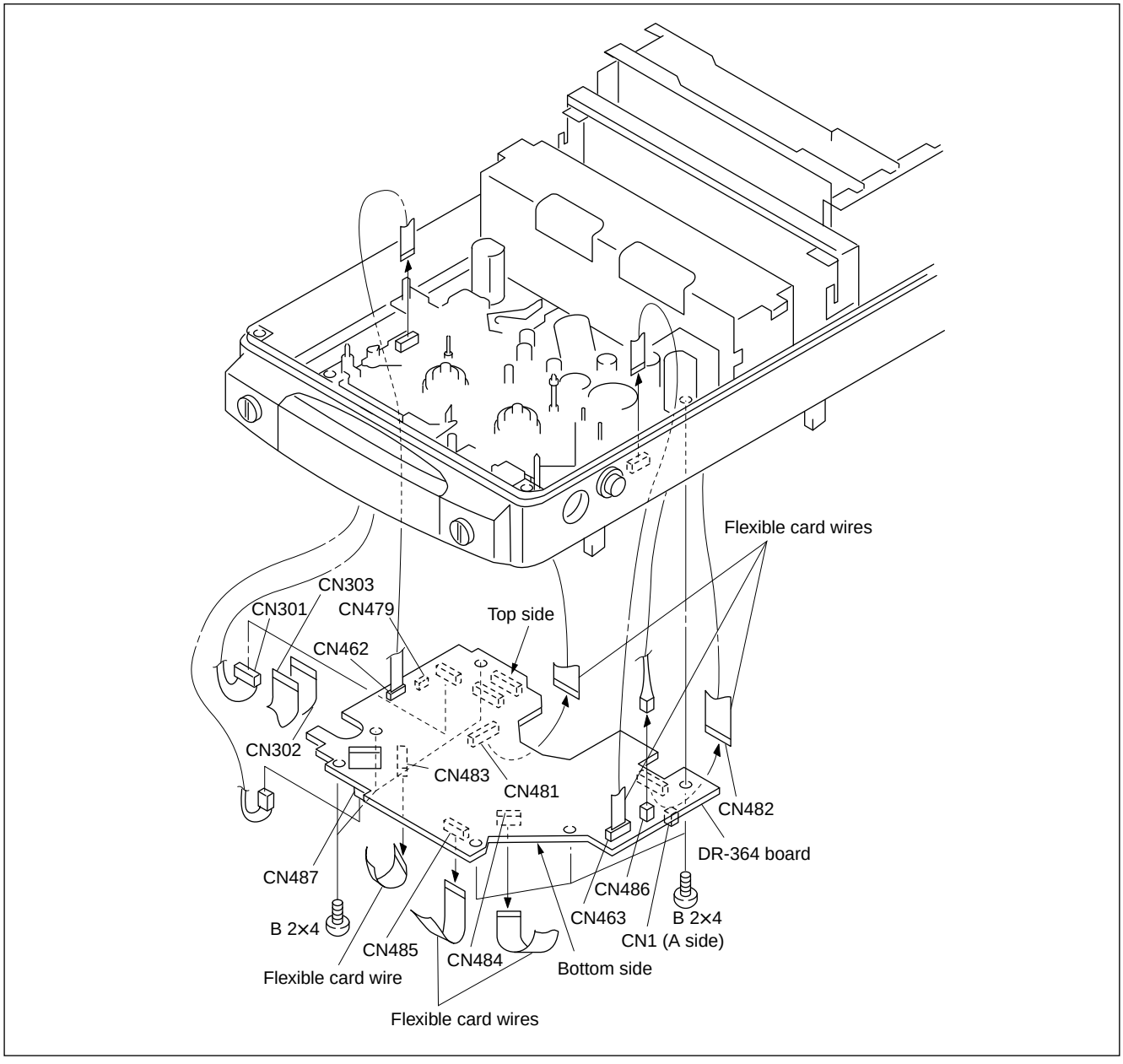
2-8-8. DDE-13 Board

1. Remove the bottom plate assembly. (Refer to section 2-6-3.)
2. Remove the flexible card wire (CN701) from the DDE-13 board.
3. Remove the four screws, and remove the DDE-13 board.
4. Attach the DDE-13 board by reversing the removal procedure.



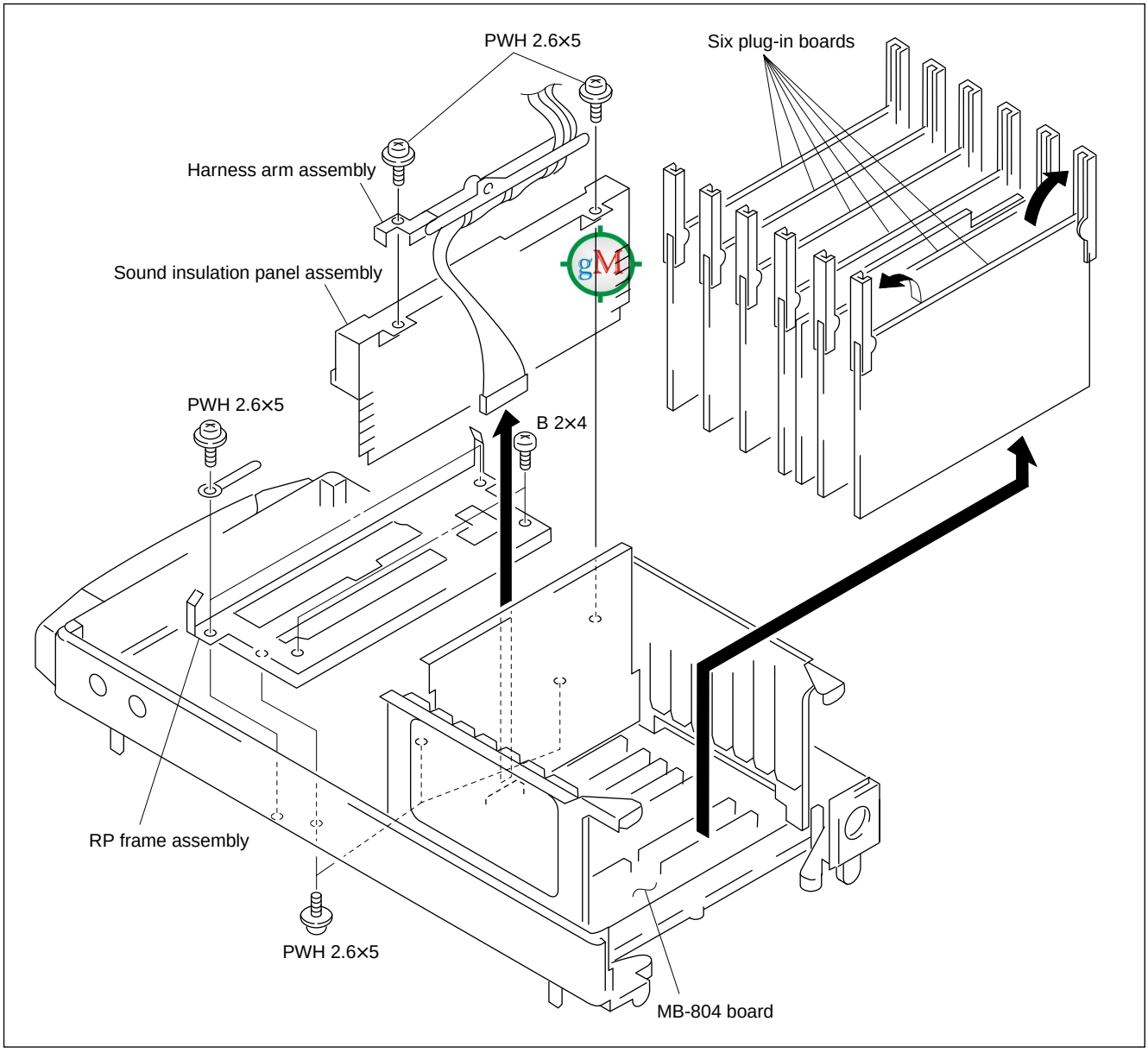
2-8-9. DR-364 Board

1. Remove the battery panel assembly. (Refer to section 2-6-1.)
2. Remove the top frame assembly. (Refer to section 2-6-2.)
3. Remove the cassette compartment assembly. (Refer to section 2-7-4.)
4. Remove the two flexible card wires (CN1, CN486) from the top of the DR-364 board, the flexible card wire (CN462) from the SE-462 board and the flexible card wire (CN463) from the SE-463 board.
5. Remove the two connectors (CN301, CN487), and the seven flexible card wires (CN302, CN303, CN481, CN482, CN483, CN485) from the bottom of the DR-364 board.
6. Remove the six screws and remove the DR-364 board.
7. Remove the two flexible card wires (CN462, CN463) from the DR-364 board.
8. Attach the DR-364 board by reversing the removal procedure.



2-8-10. MB-804 Board

1. Remove the bottom plate assembly. (Refer to section 2-6-3.)
2. Remove the cassette compartment assembly. (Refer to section 2-7-4.)
3. Remove the battery panel assembly. (Refer to section 2-6-1.)
4. Remove the top frame assembly. (Refer to section 2-6-2.)
5. Remove all the plug-in boards. (Refer to section 2-8-1.)
6. Remove the RE-159 board. (Refer to section 2-8-5.)
7. Remove the DC-97 board. (Refer to section 2-8-4.)
8. Remove the DDE-13 board. (Refer to section 2-8-8.)
9. Remove the flexible card wire from the connectors CN602 and CN702 on the MB-804 board.
10. Remove the RP-105 board and the DAP-21 board. (Refer to sections 2-8-6 and 2-8-7.)
11. Remove the rear panel assembly. (Refer to section 2-6-4.)
12. Remove the mechanism chassis assembly. (Refer to section 2-7-5.)
13. Remove the two screws, and remove the sound insulation panel assembly and the harness arm assembly.

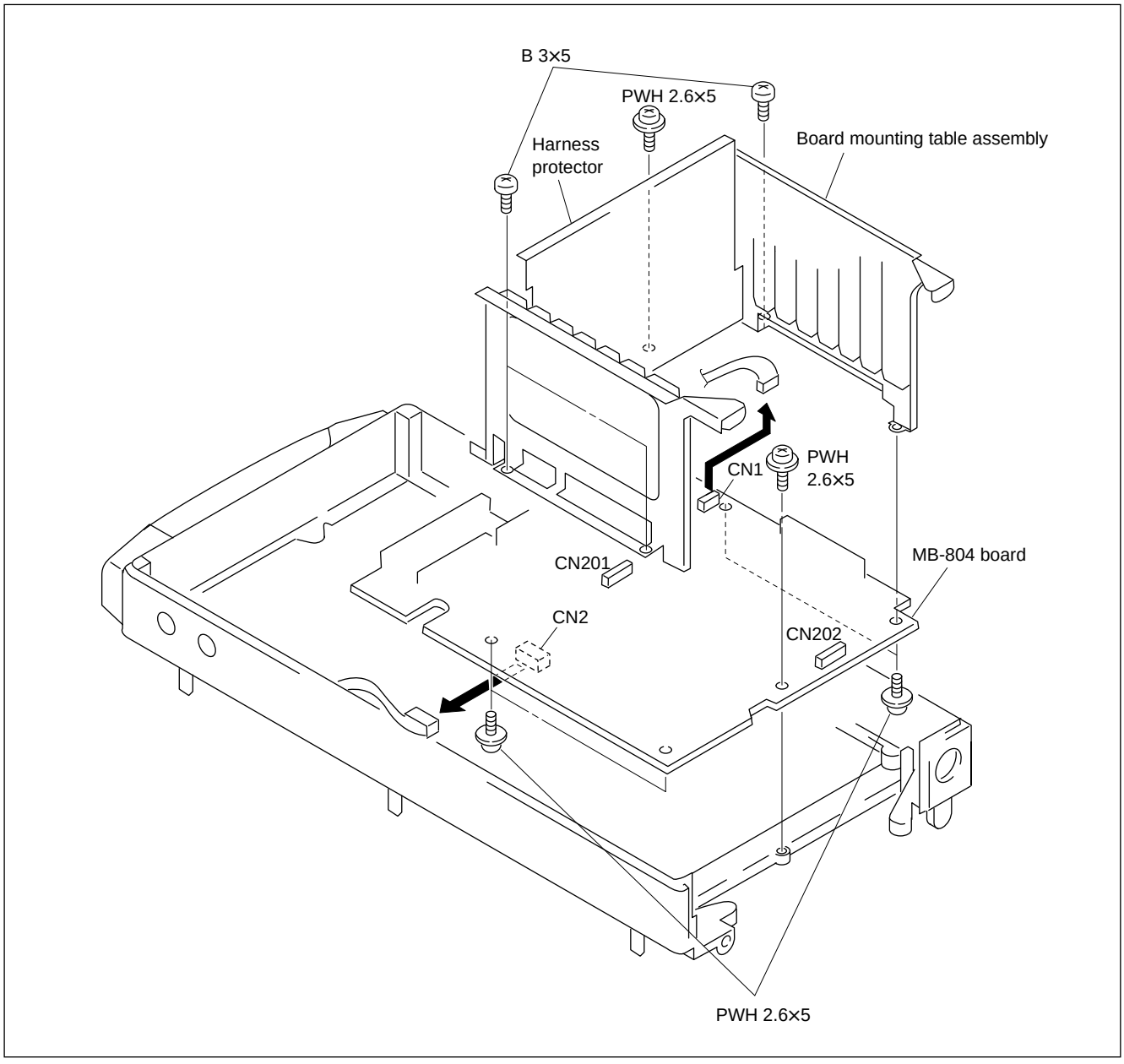


14. Remove the two connectors (CN1 and CN2) from the MB-804 board.
15. Remove the seven screws and remove the RP frame assembly.
16. Remove the screw securing the harness protector. Remove the remaining three screws securing the board mounting table assembly. Remove the screw securing the MB-804 board. Remove the MB-804 board together with the board mounting table assembly.
17. Remove the harnesses from the two connectors (CN201 and CN202) on the MB-804 board.
18. Remove the four screws from the rear of the MB-804 board. Remove the board mounting table assembly.

Note when re-attaching the MB-804 board :

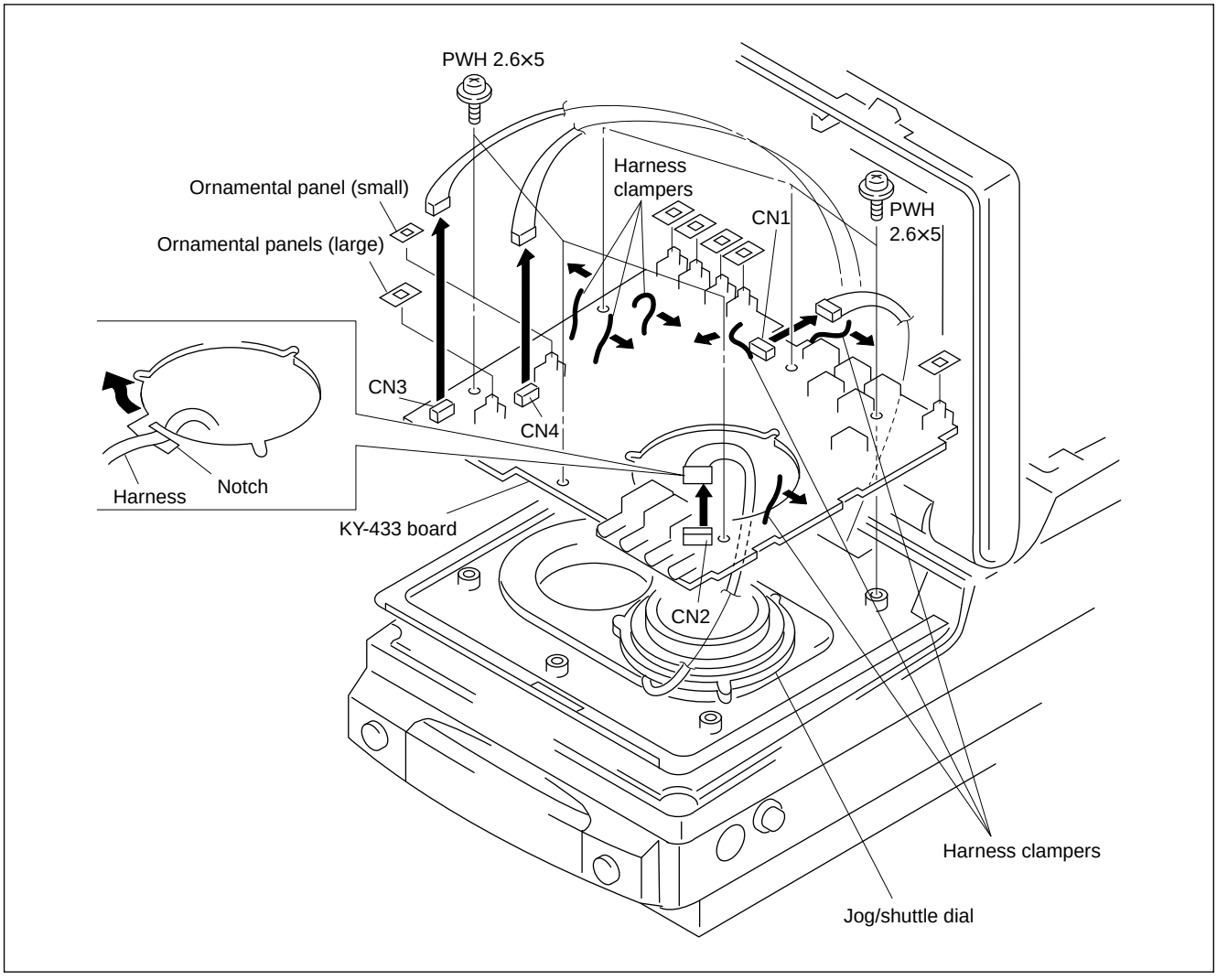
Attach the MB-804 board not to pinch the harness.

19. Attach the MB-804 board by reversing the removal procedure.



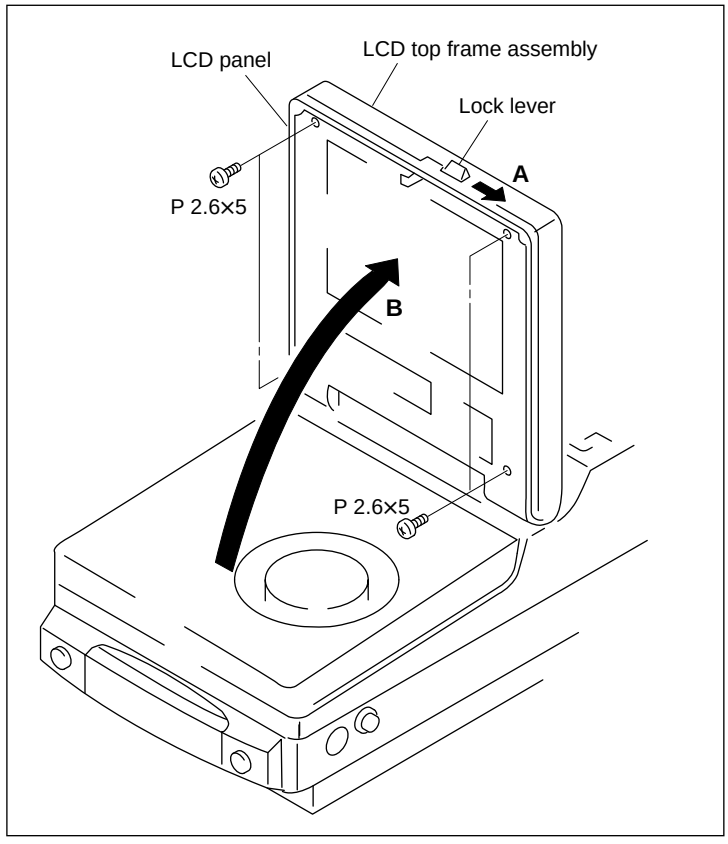
2-8-11. KY-433 Board

1. Remove the control panel assembly. (Refer to section 2-6-5.)
2. Remove the harness from the six harness clampers. Remove the three connectors (CN1, CN3 and CN4) from the KY-433 board.
3. Remove the connector (CN2) from the KY-433 board and remove the harness from the notch.
4. Remove the six screws and remove the KY-433 board.
5. Remove the six switch ornamental panels (large) and the switch ornamental panel (small).
6. Attach the KY-433 board by reversing the removal procedure.

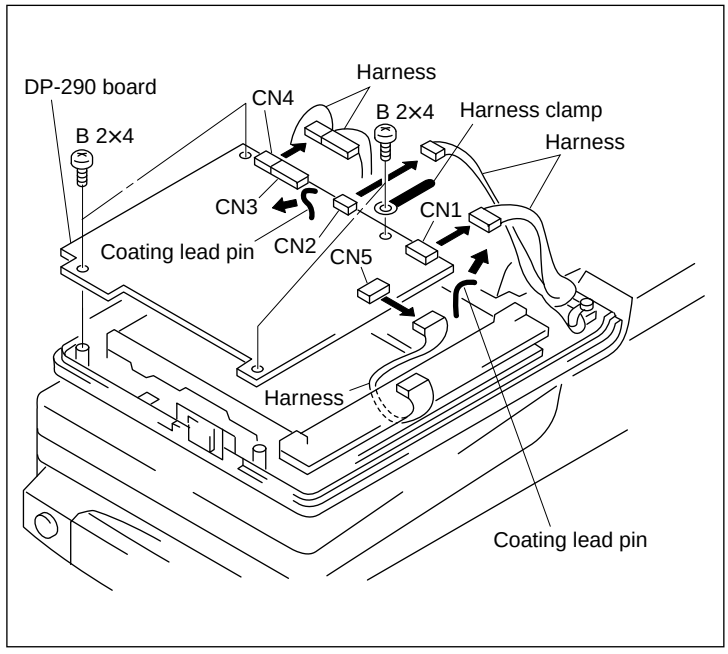


2-8-12. DP-290 Board

1. Push the lock lever in the direction of arrow **A**, and open the LCD panel in the direction of the arrow **B**.
2. Remove the four screws from the LCD panel. Then tilt the LCD panel to the original position, and remove the LCD top frame assembly.

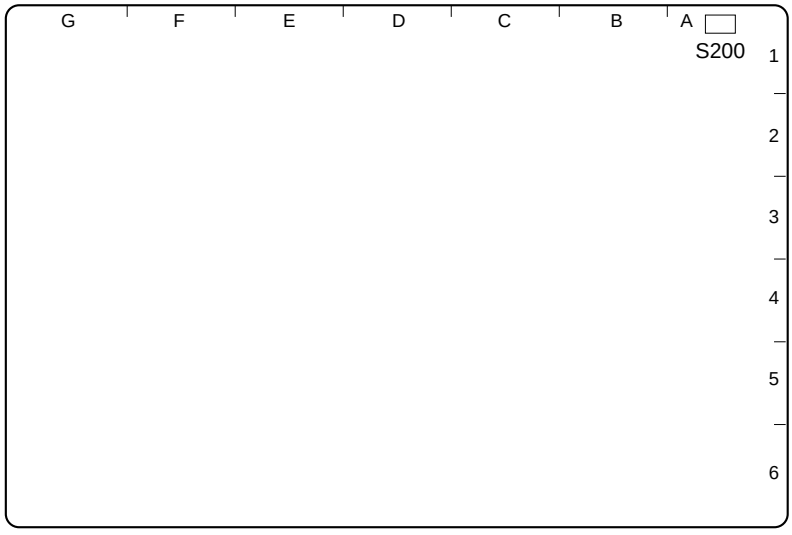


3. Remove the harness from the two coating lead pins and from the harness clamp respectively. Remove the harness from the five connectors (CN1, CN2, CN3, CN4 and CN5) on the DP-290 board.
4. Remove the four screws and remove the DP-290 board.
5. Attach the DP-290 board by reversing the removal procedure.



2-9. ON-BOARD SWITCH AND SLIT LAND SETTING

DDE-13 Board



DDE-13 Board (B Side)

Switch

Note : Never change the factory setting of the switches that are marked with "Factory use".

Ref No.	Name	Description	Factory Setting
S200	A/D LEVEL REF	Used for the A/D conversion level adjustment. When set to ON, the reference amplitude signal from the internal data is output to be used for A/D conversion level adjustment. Be sure to return to OFF upon completion of setting. **Note : S200/DDE-13 functions only when S101-1/SV-203 is set to ON.**	OFF

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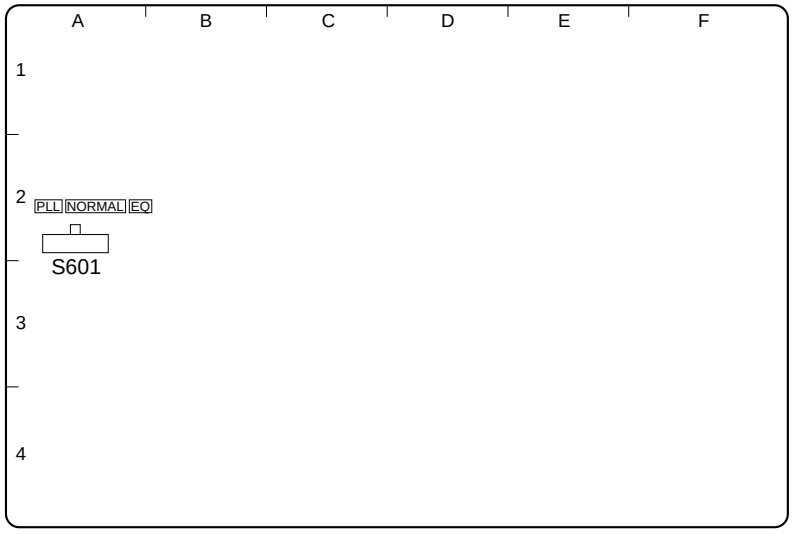
PPR-11/11P Board



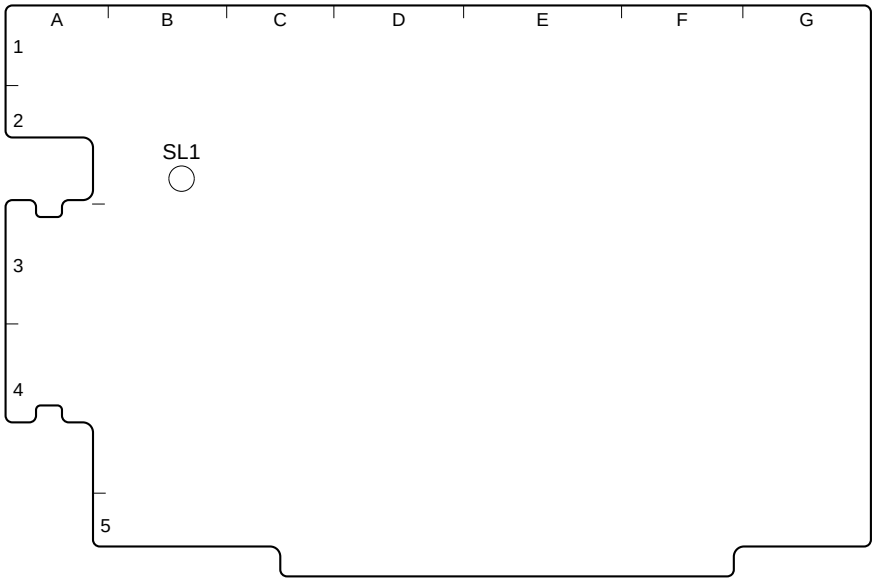
PPR-11/11P Board (A Side)

Switch

Note : S601/PPR-11 or PPR-11P functions only when S101-1/SV-203 is set to ON (CLOSE).
Never change the factory setting of the switches that are marked with "Factory use".

Ref No.	Name	Description	Factory Setting
S601	PATHOLOGICAL CHECK SIGNAL	Sends out the transmission stress check signal to the SDI output (option). NORMAL ; Outputs the normal video signal. PLL ; Outputs the PLL test signal. EQ ; Outputs the equalizer test signal. * When PLL or EQ is selected, the analog output becomes the ILLEGAL signal.	NORMAL

RE-159 Board

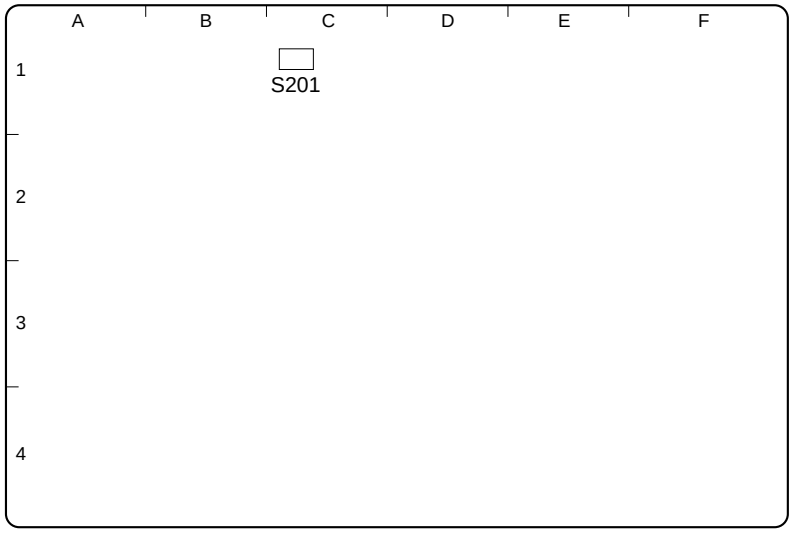


RE-159 board (A Side)

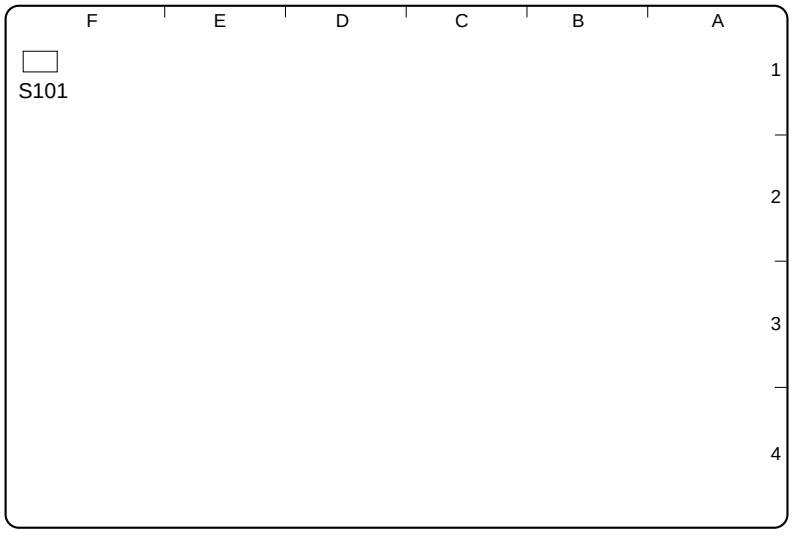
Slit Land

Ref No.	Description	Factory Setting
SL1	Switches the power supply selection method when both an external power supply and batteries are connected at the same time. Open : Selects forcibly an external power supply. Short : Selects normally an external power supply, but selects automatically batteries when the input voltage decreases about 10.5 V or less.	Open

SY-269 Board



SY-269 Board (A Side)



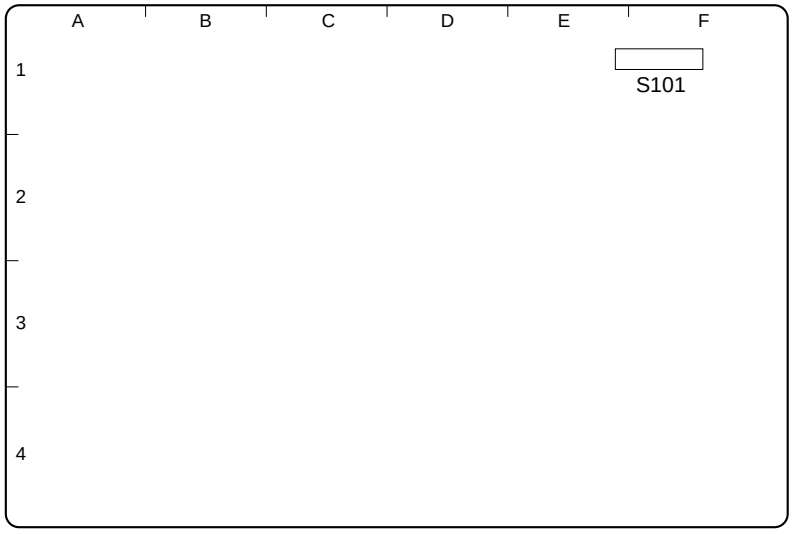
SY-269 Board (B Side)

Switch

Note : The switches of S201-7 through S201-8 are adjusted in accordance with the characteristics of the respective equipment. Set these switches only when the SY-269 board is exchanged.
Never change the factory setting of the switches that are marked with "Factory use".

Ref No.	Name	Description	Factory Setting
S101	SYSTEM RESET	Press to reset the system control operation.	–
S201-1 to S201-6		Factory use	OFF
S201-7	J/UC	OFF : For the models outside Japan ON : For Japanese model	OFF
S201-8	525/625	OFF : 525/60 models ON : 625/50 model	OFF (for DSR-70) ON (for DSR-70P)

SV-203 Board



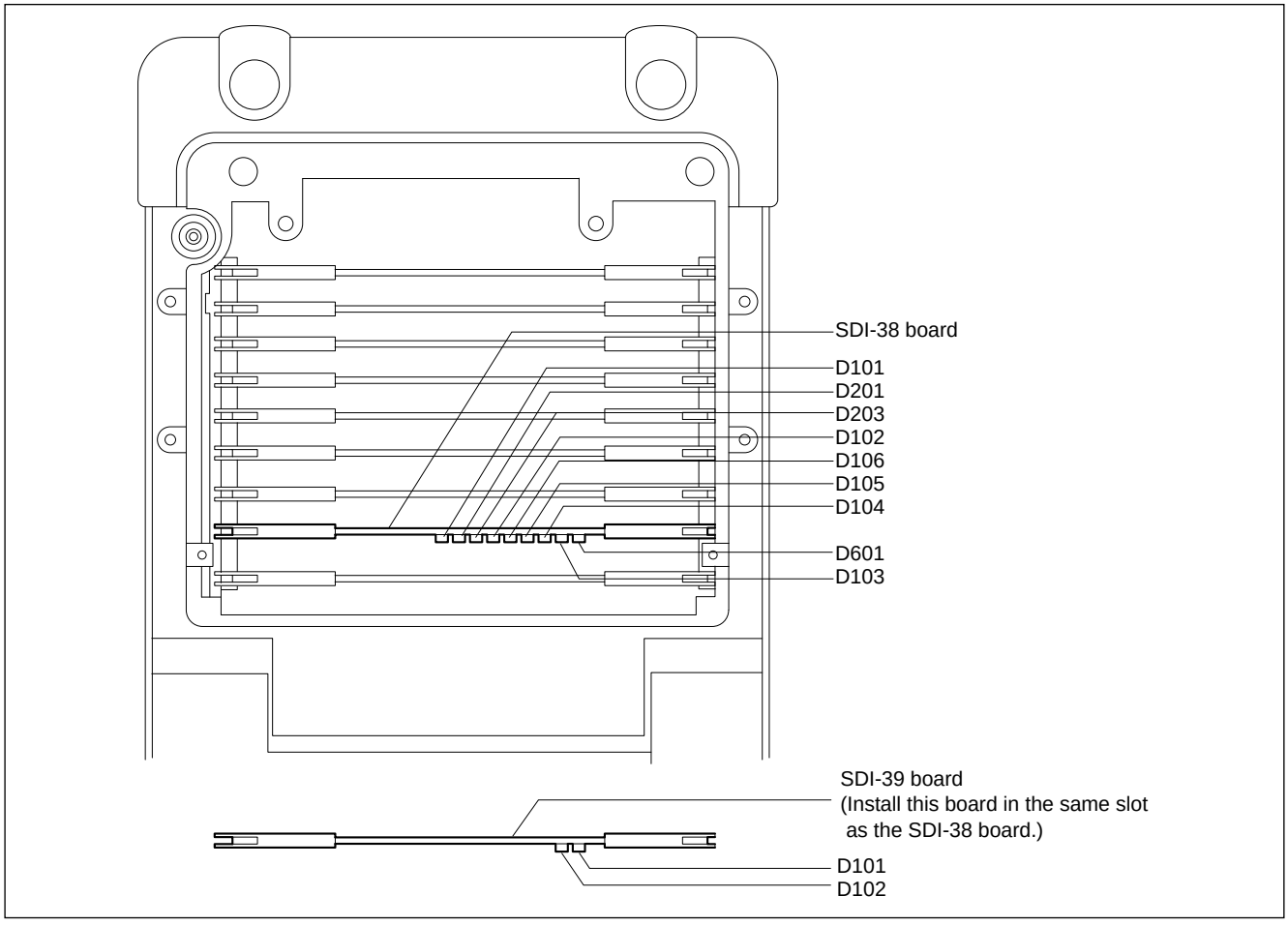
SV-203 board (A Side)

Switch

Note : S201 is operated only during adjustment.
Never change the factory setting of the switches that are marked with "Factory use".

Ref No.	Name	Description	Factory Setting
S101-1	Factory use	Used during adjustment in factory. OFF : Normal operation ON : Adjustment position	OFF
S101-2	no use		OFF
S101-3	Factory use	Turns ON/OFF the top/end sensor. OFF : Normal operation ON : Disables the top/end sensor.	OFF
S101-4	Factory use	Turns ON/OFF the error detection. OFF : Error is detected. (Normal operation) ON : Error is not detected. (Used during adjustment)	OFF
S101-5	Factory use	Sets the DVCAM/DV fixed mode. OFF : Normal operation ON : The system operates in the mode set by S101-6.	OFF
S101-6	Factory use	When S101-5 is ON. OFF : DVCAM mode ON : DV mode	OFF
S101-7	Factory use	Turns ON/OFF the prohibition of mechanism operation. OFF : Normal operation ON : Prohibits the mechanism operation.	OFF
S101-8	Designer use	–	OFF

2-10. ON-BOARD INDICATOR DESCRIPTION



SDI-38 Board

Note : Indicators D103 through D106 function normally when the received signal support EDH *.

Receiving side

∗EDH : Error Detection and Handling

Ref No.	Name	Illuminating Color	Description	Condition in Normal Operation
D101	SDI INPUT EXIST	green	Turns on when the SDI format signal is input to the SDI IN connector.	Turns on.
D102	RX EDH VALIDITY	green	Turns on when the signal that is input to the SDI IN connector supports EDH.	Turns on.
D103	RX EDH OTHER ANC ERROR	orange	Turns on when the signal that is input to the SDI IN connector has the other ancillary data in its EDH block.	Turns off.
D104	RX EDH ACTIVE PICTURE ERROR	red	Turns on when the EDH error of active picture is detected from the signal that is input to the SDI IN connector.	Turns off.
D105	RX EDH FULL FIELD ERROR	red	Turns on when the EDH error of full field is detected from the signal that is input to the SDI IN connector.	Turns off.
D106	RX EDH ANCILLARY DATA ERROR	red	Turns on when the EDH error of ancillary data is detected from the signal that is input to the SDI IN connector.	Turns off.
D201	TRS ERROR	red	Turns on when the frame output that is created from the signal that is input to the SDI IN connector, performs the fly-wheel operation.	Turns off.
D203	AUDIO ERROR	red	Turns on when the audio IC (IC204) of the SDI IN side detects an error.	Turns off.

Sending side

Ref No.	Name	Illuminating Color	Description	Condition in Normal Operation
D601	UNLOCK	red	Turns on when the PLL of the parallel-to-serial IC (IC607) of the SDI output block, does not lock in.	Turns off.

SDI-39 Board

Receiving side

Ref No.	Name	Illuminating Color	Description	Condition in Normal Operation
D101	SERIAL IN	green	Turns on when input to the serial-to-parallel conversion IC that indicates that the QSDI/SDI signal is input, is detected.	Turns on.
D102	CRC ERR	red	Turns on when SDTI IC detects the CRC error.	Turns off.

2-11. HOW TO EJECT A CASSETTE TAPE WHEN TAPE HAS SLACK (MANUAL EJECT)

Be careful not to damage the tape when taking the cassette tape out.

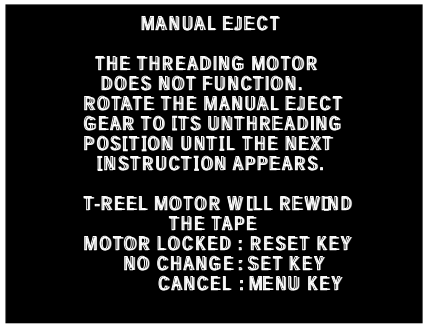
• If an error is detected :

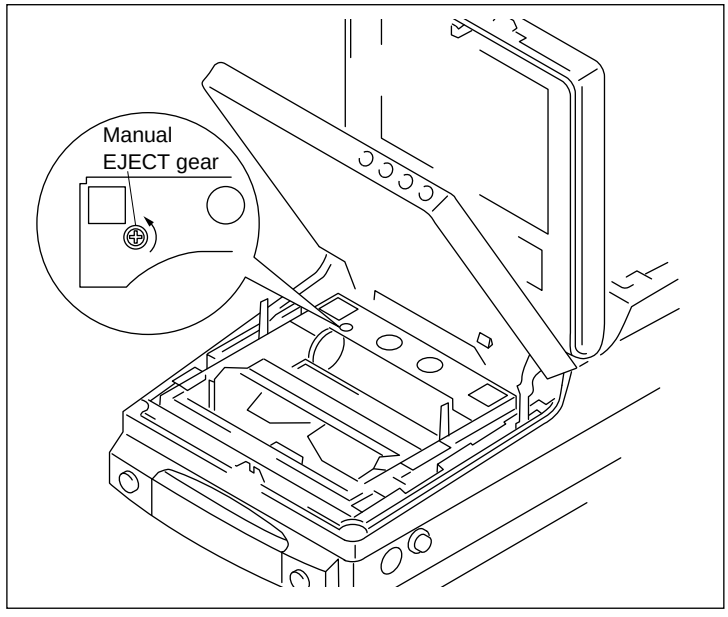
1. Press the [EJECT] key and enter the Emergency EJECT mode and eject a cassette. (Refer to section "3-2. ERROR CODES".)

• If the cassette tape cannot be ejected by the procedure described above :

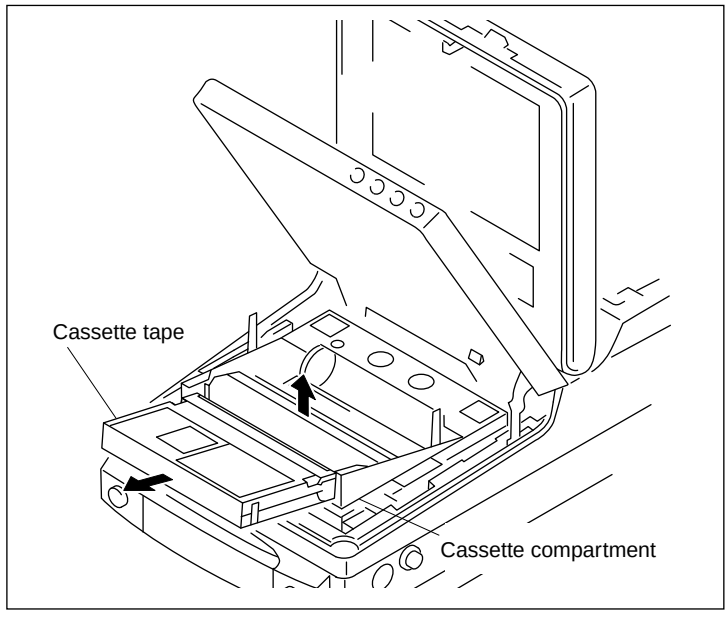
1. Enter the SERVICE SUPPORT mode and select MANUAL ELECT. (Refer to section "4-2-2. How to Enter the Maintenance Menu", and "4-3-6. Service Support".)
2. Follow the instructions on display as shown below and eject a cassette tape by responding to the dialogue while checking the tape condition and motor movement.

   (1) When the following message appears : Rotate the manual EJECT gear in the direction of the arrow by pressing the gear with the Philips (+) head screwdriver until the cassette compartment is raised and a cassette tape is ejected.


MANUAL EJECT
THE THREADING MOTOR DOES NOT FUNCTION. ROTATE THE MANUAL EJECT GEAR TO ITS UNTHREADING POSITION UNTIL THE NEXT INSTRUCTION APPEARS.
T-REEL MOTOR WILL REWIND THE TAPE
MOTOR LOCKED : RESET KEY
NO CHANGE : SET KEY
CANCEL : MENU KEY



   (2) If the take-up reel motor does not rotate and a tape cannot be wound onto a reel : Select the message "T REEL MOTOR DOES NOT ROTATE" from the above display and let the supply reel motor wind the tape. After confirming that the supply reel motor winds the tape completely, rotate the manual EJECT gear in the direction of the arrow by pressing the gear with the Philips (+) head screwdriver until the cassette compartment is raised and a cassette tape is ejected.

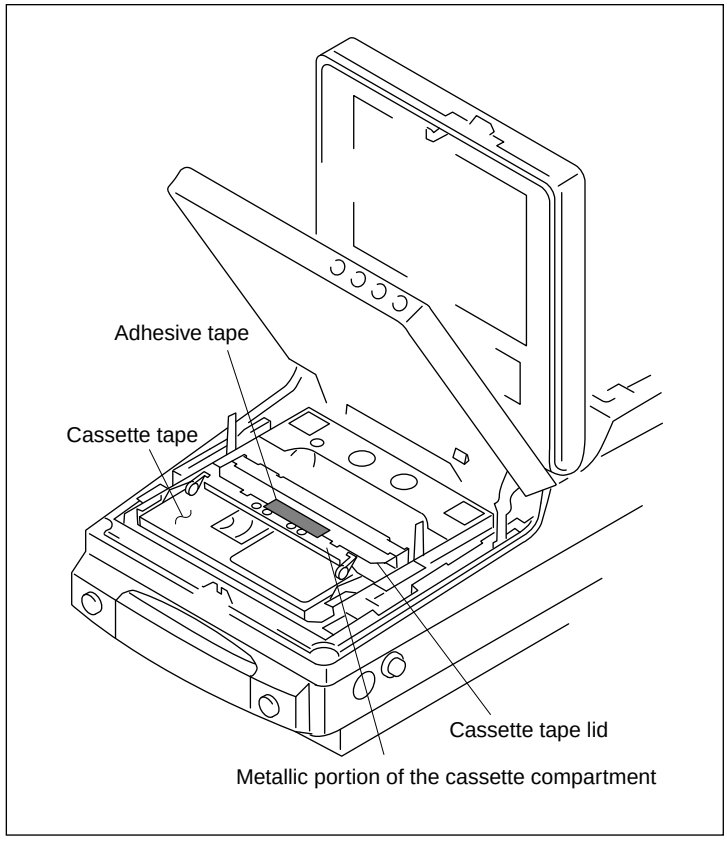


(3) When the following message appears:
Remove a cassette tape referring to the following "• How to remove a cassette compartment and to remove a cassette tape when the main power cannot be turned on".

```
        MANUAL EJECT

    THE TAPE COULD NOT BE
    EJECTED. TURN THE POWER
    OFF, AND MOVE
    THE CASS-COMPARTMENT UP
    WITH THE MANUAL EJECT
    GEAR WHILE HOLDING THE
    LID OF CASSETTE OPEN.
    THEN REMOVE THE
    CASS-COMPARTMENT.
            MENU : MENU KEY
```

(4) When the following message appears:
Fix the cassette compartment lid with an adhesive tape as shown so that the cassette compartment lid should not be closed. Raise the cassette compartment following the instructions on display until the next message appears.

```
        MANUAL EJECT

    KEEP PRESSING (↓) KEY
    UNTIL THE NEXT
    INSTRUCTION APPEARS.
    AND MOVE THE CASSETTE
    COMPARTMENT UP WHILE
    HOLDING THE LID OF
    CASSETTE OPEN.

        NO CHANGE:RESET KEY
           CANCEL: MENU KEY
```

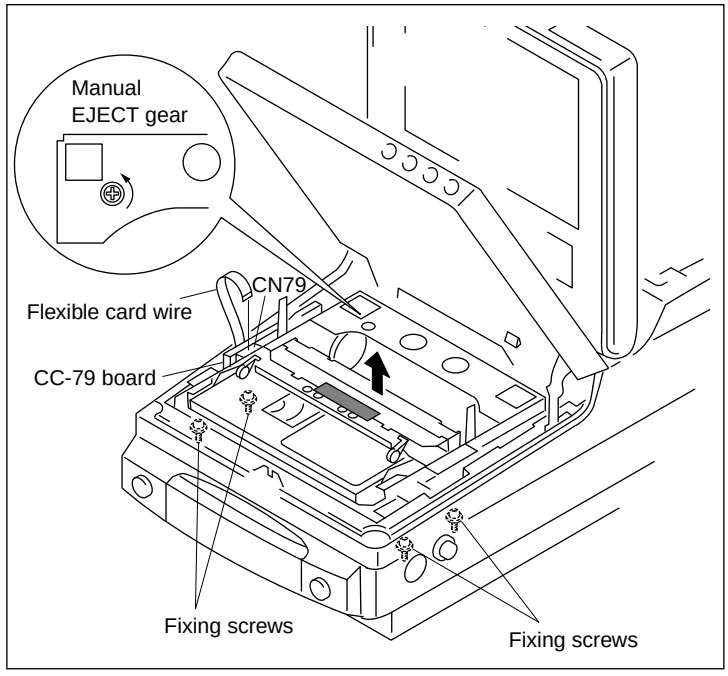


(5) When the following message appears:
Follow the instructions on display and remove a cassette tape referring to the following steps (2) to (7) of "• How to remove a cassette compartment and to remove a cassette tape when the main power cannot be turned on".

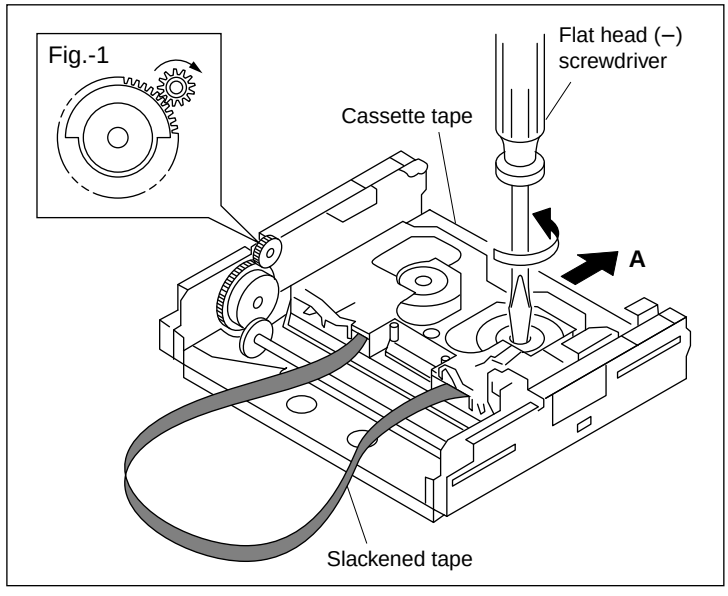
```
        MANUAL EJECT

    TURN THE POWER OFF
    THEN REMOVE THE
    CASSETTE COMPARTMENT.




            MENU : MENU KEY
```

- **How to remove a cassette compartment and to remove a cassette tape when the main power cannot be turned on**

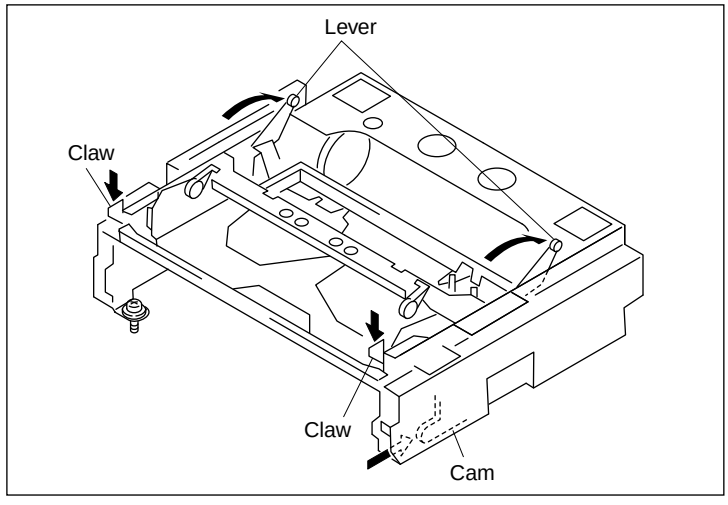
  (1) Turn off the main power.
  (2) Remove the flexible card wire from the connector (CN79) on the CC-79 board.
  (3) Fix the cassette compartment lid with an adhesive as shown so as not the cassette compartment lid should not be closed. Rotate the manual EJECT gear in the direction of the arrow by pressing the gear with the Philips (+) head screwdriver until the cassette compartment is raised vertically as far as it can go.
  (4) Remove the four screws and remove a cassette compartment.



  (5) Rotate the reel hub with a flat head (–) screwdriver until tape is taken up to remove a tape slack. Close the cassette lid.
  (6) Rotate the gear in the direction of the arrow until the cassette compartment moves to the "cassette out" state. (Refer to Fig.-1.)
  (7) Remove a cassette tape from the cassette compartment.



3. How to attach the cassette compartment
  (1) Push the lever in the direction of the arrow.
  (2) Press down the claws (two claws in the right and left) in the direction of the arrow until the cassette compartment is raised vertically as far as it can go.
  (3) Push in the cam until it is locked.
  (4) Attach the cassette compartment. (Refer to section "2-7-4. Cassette Compartment Assembly".)



2-12. HEAD CLEANING WHEN HEAD CLOGGING OCCURS

Clean the video head as follows when the head gets dirty.

• Procedure to use the cleaning cassette

1. Insert the cleaning cassette DVM12CL in this unit. Confirm that the unit enters the play mode, the [PLAY] key lights and the display appears.
   Note : Use only the DVM12CL cleaning cassette tape.
   If another cleaning cassette tape is used, abnormal abrasion or breakage of the video head could occur.

2. The cleaning cassette tape is automatically ejected after running for 10 seconds.
   Note : Do not rewind the cleaning cassette tape to use it again.

3. Make sure that the head is no longer dirty.
   If the video head is still dirty after step 2 above, clean the video head as follows.

• Procedure to use the cleaning cloth

1. Soak the cleaning cloth with cleaning liquid and bring it into contact lightly with the video head.
2. Turn the upper drum slowly by hand in the rotating direction of the head (counterclockwise when viewed from the top) to clean the video head.
   Note :
   - **Never move the cleaning cloth in the vertical direction against the video head because it may break the head.**
   - **Turn the power switch off when cleaning the video head.**

2-13. OPERATING THE VCR WITHOUT A CASSETTE TAPE

When adjusting the mechanical block, the VCR is sometimes operated without a cassette tape. This section describes how to do this.

1. Remove the cassette compartment from this unit.
2. Turn on switches S101-3 and 4 of the SV-203 board, then turn on the main power.

The operating method of each mode is as follows.

- THREADING
  While pressing the S/T reel motors, press the [STOP] key. The upper drum rotates, threading ring rotates. The unit enters the threading mode. The tension arm and the threading ring move to the specified position, then the threading is completed. This condition in which the threading is completed is referred to as the STOP status.

- PLAY
  Press the [PLAY] key.
  The pinch roller is pressed against the capstan shaft to enter the PLAY status.
  When the [PLAY] key is pressed during threading, the pinch roller is pressed against the capstan shaft to enter the PLAY status after the threading has completed.

- FF
  Press the [F FWD] key.
  The pinch roller is pressed against the capstan shaft to set the FWD.SEARCH to five-times speed.

- REW
  Press the [REW] key.
  The pinch roller is pressed against the capstan shaft to set REV.SEARCH to five-times speed.

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- REC
  - When the reel table is on the S position:
    While pressing the record proof switch on the right side of the T side reel table, press both the [PLAY] key and the [REC] key.
    The pinch roller is pressed against the capstan shaft to enter REC status.
    When the record proof switch is released, the REC status is released and the recorder returns to PLAY status.
  - When the reel table is on the standard position:
    While pressing the record proof switch on the right side of the T side reel table, press both the [PLAY] key and the [REC] key.
    The pinch roller is pressed against the capstan shaft to enter REC status.
    When the record proof switch is released, the REC status is released and the recorder returns to PLAY status.

- UNTHREADING
  Press the [EJECT] key.
  The threading ring rotates to enter the unthreading mode.
  The threading ring moves to the specified position to complete the unthreading.

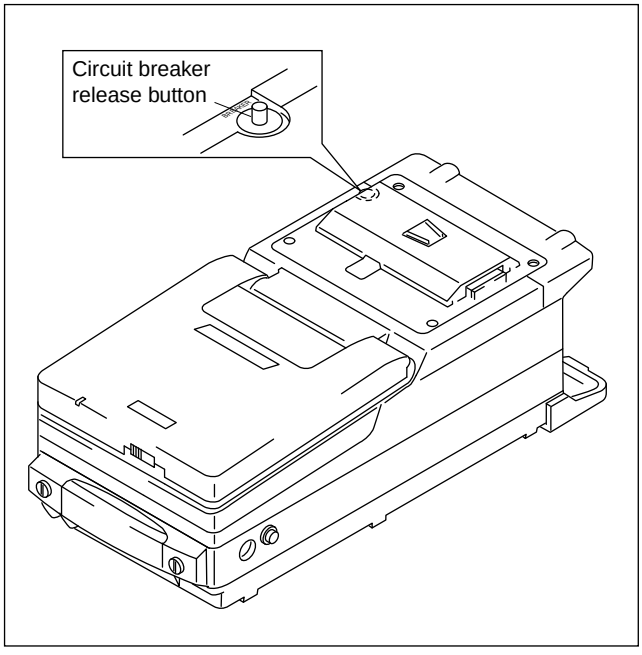
- Switching the MINI or STD position of reel size without cassette compartment.
  (1) Without a cassette tape, turn on the switch S101-1/SV-203.
  (2) Press the [PAGE] key on the control panel.
  Every pressing toggles between the MINI and the STD reel positions.

Note : Make sure to turn off switches S101-3 and 4 on the SV-203 board after the adjustment.

2-14. ON POWER PROTECTION CIRCUIT

2-14-1. Resetting Circuit Breaker

When excessive current flow inside the DSR-70/70P, a circuit breaker shuts down the main power. When the circuit breaker works, remove the main power supply and inspect inside the DSR-70/70P to locate and remove the cause of the excessive current. When removing the main power supply, not only turn off the main power switch but also remove the equipment that is connected to the DC IN connector and remove also battery.
After inspection is completed, push in the circuit breaker release button. When the DSR-70/70P has no abnormality, the main power is turn on again.



2-14-2. On IC Link

The IC link (F1) on the FL-256 board blows when the DSR-70/70P has any abnormality inside and an excessive current flow.
When the IC link blows, remove the main power supply and inspect inside the DSR-70/70P to locate and remove the cause of the excessive current.
Be sure to use the specified parts as the replacement IC links as listed below.

WARNING

IC links are critical to safe operation. Using the IC links other than the specified ones as the replacement IC links can cause fire and/or electric shock.

Board	Ref. No.	Part Name	Part Number
FL-256	F1	IC LINK 0.4 A	⚠ 1-576-122-21
MB-804	PS301	Fuse 5 A	⚠ 1-533-627-21
	PS302, 303, 304, 305	IC LINK 0.8 A	⚠ 1-576-123-21
DDE-13	PS1, 2, 3, 4, 5	IC LINK 1.0 A	⚠ 1-576-124-21
AU-259	PS601	IC LINK 1.0 A	⚠ 1-576-124-21
DEN-11	PS1, 2, 3, 4, 5	IC LINK 1.0 A	⚠ 1-576-124-21
SV-203	PS101, 102	IC LINK 0.8 A	⚠ 1-576-123-21
SY-269	PS102	IC LINK 1.0 A	⚠ 1-576-124-21
	PS101, 103	IC LINK 0.6 A	⚠ 1-576-259-21
PPR-11	PS101, 102, 103	IC LINK 1.0 A	⚠ 1-576-124-21
RPR-11	PS101, 102, 103	IC LINK 1.0 A	⚠ 1-576-124-21
DAP-21	PS1, 2	IC LINK 1.0 A	⚠ 1-576-124-21
RP-105	PS201, 202, 203	IC LINK 1.0 A	⚠ 1-576-124-21
KY-433	PS102, 103	IC LINK 0.4 A	⚠ 1-576-122-21
	PS101	IC LINK 1.0 A	⚠ 1-576-124-21
DV-19	PS401, 402	IC LINK 2.0 A	⚠ 1-533-282-21
SDI-39	PS101, 102	IC LINK 1.0 A	⚠ 1-576-124-21

2-15. ON BACKUP BATTERY

The backup battery is used for the memory (IC209) on the SY-269 board. Use the specified battery when replacing it.

Replacement part	: A4/SY-269 board
Part name	: M4Z28-BR00SH1 (Lithium battery)
Part number	: 1-528-749-11
Recommended replacement period	: Every six years

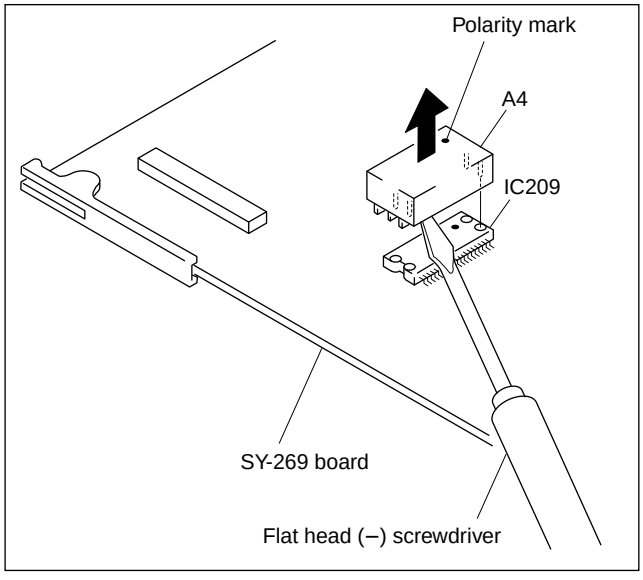
The following data is saved in the memory (IC209/ SY-269). When battery runs out or when the battery is replaced, re-setting of the sub LCD menu is required. Refer to the Operation Manual supplied with the DSR-70/ 70P for the procedure of re-setting.

• Sub LCD menu

Backup battery replacement procedure

Note : When replacing the battery, insert the replacement battery with the "+" and "–" ends correctly oriented. If the battery's positive (+) and negative (–) terminals are backward, physical injury or damage to peripheral equipment can be result due to explosion and or leakage of internal materials.

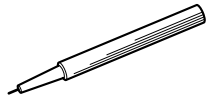
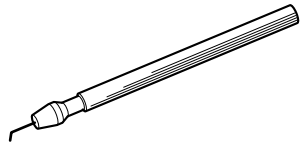
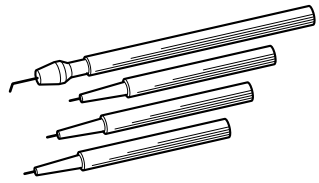
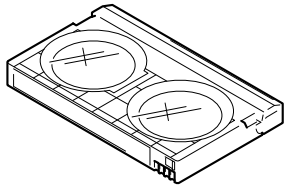
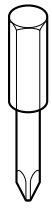
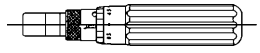
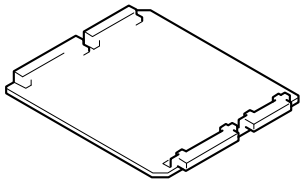
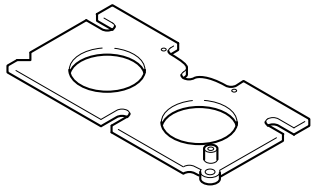
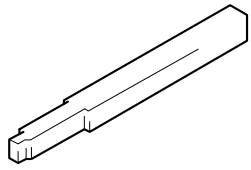
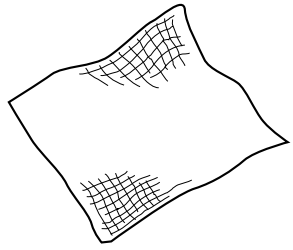
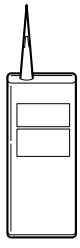
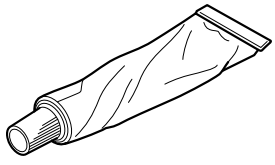
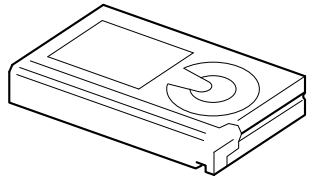
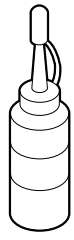
1. Remove the SY-269 board. (Refer to section 2-8-1.)
2. Insert tip of a flat head (–) screwdriver in between the battery A4 and IC209, and remove the battery.
3. Insert the replacement battery with A4's positive (+) and negative (–) terminals agreeing with the battery mounting's polarity marks on IC209.
4. Perform re-setting of the sub LCD menu. (Refer to the Operation Manual supplied with the DSR-70/70P.)



2-16. LIST OF TOOLS AND ADJUSTMENT EQUIPMENT

2-16-1. Tools

Drawing No.	Part No.	Name	Uses
①	J-6080-029-A	Small dental mirror	Video tracking adjustment
②	J-6082-231-A	Washer fixture	Part replacement
③	J-6082-234-A	Washer removable jig	Part replacement
④	J-6082-236-A	Washer removable jig	Part replacement (No. 2 and No. 5 are assorted.)
⑤	J-6082-362-A	Tape guide adjustment screwdriver	Tape guide height adjustment
⑥	J-6082-373-A	Torque cassette	FWD/REV back tension adjustment
⑦	J-6325-110-A	Torque screwdriver bit (for M1.4)	Part replacement
⑧	J-6325-380-A	Torque screwdriver bit (for M2)	Part replacement
⑨	J-6325-400-A	Torque Driver (3 kg/cm)	Tightening screws
⑩	J-6443-520-A	Extension board (DJ-352)	–
⑪	J-6442-990-A	Reference plate	Reel table height adjustment, reference plate for tape guide height adjustment
⑫	J-6442-420-A	Guide gauge	Tape guide height adjustment
⑬	3-184-527-01	Cleaning cloth	Cleaning
⑭	7-432-114-11	Three Bond 1401B	Screw lock
⑮	7-662-010-04	Sony grease SGL-505 (20g)	Part replacement
⑯	8-967-999-02	Alignment tape, XH2-1AST	Tape path system adjustment
⑰	8-967-999-22	Alignment tape, XH5-1A2	Audio/video system adjustment
⑱	8-967-999-31	Alignment tape, XH4-1A	Audio/video system adjustment
⑲	8-919-573-01	Cleaning liquid	Cleaning

①	② 	③ 	④ 
⑤	⑥ 	⑦ ⑧ 	⑨ 
⑩ 	⑪ 	⑫ 	⑬ 
⑭ 	⑮ 	⑯ ⑰ ⑱ 	⑲ 

2-16-2. Measuring Equipment and Tools

2-16-2-1. Measuring Equipment and Tools

Type of measuring equipment	Equivalent	Remarks
Oscilloscope	Tektronix 2445	150 MHz or more
Video signal generator	TSG-130A (Op.02) (for DSR-70), TSG-131A (Op.02) (for DSR-70P)	
Waveform monitor	Tektronix 1760 Op. SC (for DSR-70), Tektronix 1761 Op. SC (for DSR-70P) Tektronix 1765 Op. SC (for DSR-70/70P)	
Audio signal generator	HP339A	
Audio level meter	HP3400A/MeguroMN-446	
Frequency counter	Advantest TR5821	
Extension board	DJ-352 (J-6443-520-A)	
Analog component I/O board	DSBK-170	
Blank tape	DVM30ME, DVM30NME	On the market

2-16-2-2. Reference Tape for Alignment (for DVR-70)

Recording contents of XH5-1A2 are followings.

VIDEO	TIME CODE (h) (m) (s)	REC (s)	AUDIO		
Black Burst	23 : 59 : 00	60	No Signal		32 kHz 4 ch
75 % Full Color Bars	00 : 00	60	1 kHz		
60 % Multi Burst	01 : 00	60	20 Hz		
Bowtie with Mod 12.5T	02 : 00	30	14.5 kHz		
Shallow Ramp	02 : 30	30	10 kHz		
	03 : 00	30	No Signal		
Cross Hatch (index)	03 : 30	30	1 kHz 0 dBFS		
Line 17	04 : 00	40	1 ch	1 kHz	
75 % Full Color Bars	04 : 40	40	2 ch		
Quad Phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black Burst	06 : 40	5	No Signal		
	06 : 45	5			48 kHz 2 ch
60 % Multi Burst (for Composite)	06 : 50	60	1 kHz		
Mod 12.5T	07 : 50	30	20 Hz		
Shallow Ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross Hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma Noise	09 : 50	30	1 kHz		
Line 17	10 : 20	30			
75 % Full Color Bars	10 : 50	180			
60 % Multi Burst	13 : 50	60			
Mod 12.5T	14 : 50	30			
Shallow Ramp	15 : 20	60			
75 % Full Color Bars	16 : 20	100			
75 % Full Color Bars (R-Y OFF)	18 : 00	180			
75 % Full Color Bars (B-Y OFF)	21 : 00	180			
Blanking Marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

* **Audio levels are –20 dBFS (Reference), except 1 kHz 0 dBFS part.**

Reference Tape for Alignment (for DVR-70P)

Recording contents of XH5-1AP2 are followings.

VIDEO	TIME CODE (h) (m) (s)	REC (s)	AUDIO		
Black Burst	23 : 59 : 00	60	No Signal		32 kHz 4 ch
100 % Full Color Bars	00 : 00	60	1 kHz		
60 % Multi Burst	01 : 00	60	20 Hz		
Bowtie with Mod 10T	02 : 00	30	14.5 kHz		
Shallow Ramp	02 : 30	30	10 kHz		
	03 : 00	30	No Signal		
Cross Hatch (index)	03 : 30	30	1 kHz 0 dBFS		
Line 17	04 : 00	40	1 ch	1 kHz	
100 % Full Color Bars	04 : 40	40	2 ch		
Quad Phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black Burst	06 : 40	5	No Signal		
	06 : 45	5			48 kHz 2 ch
60 % Multi Burst (for Composite)	06 : 50	60	1 kHz		
Mod 10T	07 : 50	30	20 Hz		
Shallow Ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross Hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma Noise	09 : 50	30	1 kHz		
Line 17	10 : 20	30			
100 % Full Color Bars	10 : 50	180			
60 % Multi Burst	13 : 50	60			
Mod 10T	14 : 50	30			
Shallow Ramp	15 : 20	60			
100 % Full Color Bars	16 : 20	100			
100 % Full Color Bars (R-Y OFF)	18 : 00	180			
100 % Full Color Bars (B-Y OFF)	21 : 00	180			
Blanking Marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

* **Audio levels are –18 dBFS (Reference), except 1 kHz 0 dBFS part.**

2-17. NOTES ON REPAIR PARTS

2-17-1. Flexible Card Wire Replacement

The following six types of flexible card wire are used in the DSR-70/70P.

Note : Take utmost care when handling the flexible card wires because their life is extremely shortened by folding.

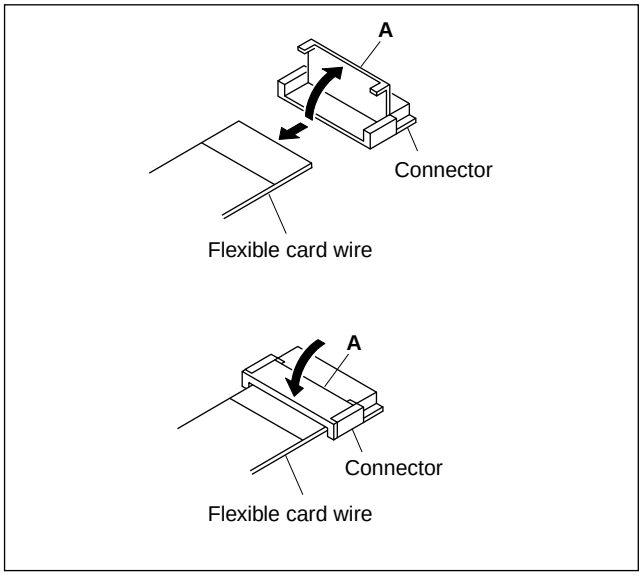
< Type A >

Removing method

Raise the portion marked "**A**" of the connector and release the lock. Pull out the flexible card wire.

Insertion method

Insert the flexible card wire fully up to the marked line and push up the portion marked "**A**" of the connector.



Note : The flexible card wire has the conduction side and the insulation side. Connect the flexible card wire after checking for the correct side as shown.
If the condition side and the insulation side are connected in the wrong direction, the circuit will not operate.

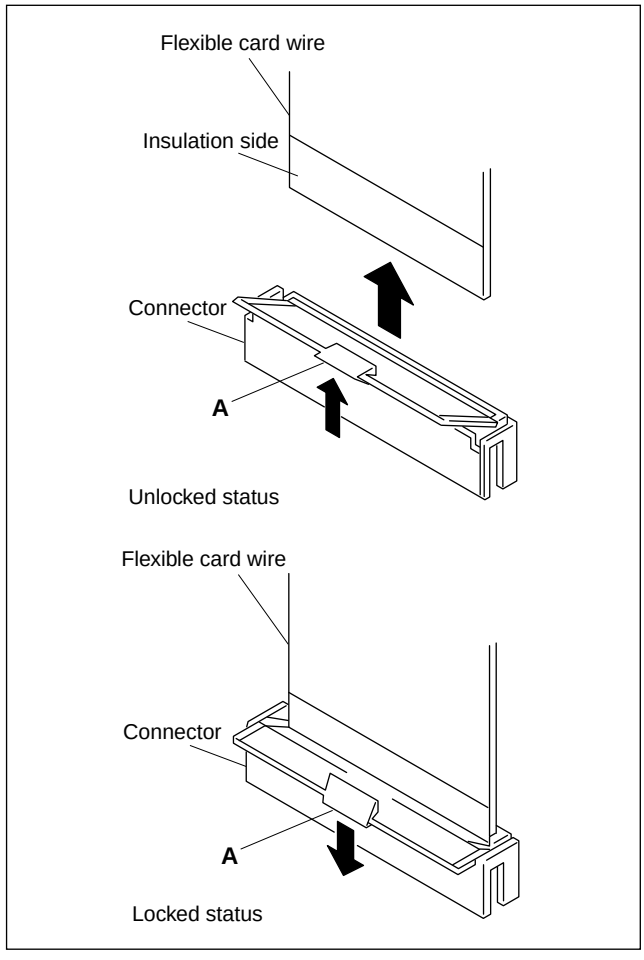
< Type B >

Removing method

Raise the portion marked "**A**" of the connector and release the lock. Pull out the flexible card wire.

Insertion method

Insert the flexible card wire fully up to the marked line and push up the portion marked "**A**" of the connector.



Note : The flexible card wire has the conduction side and the insulation side. Connect the flexible card wire after checking for the correct side as shown.
If the condition side and the insulation side are connected in the wrong direction, the circuit will not operate.

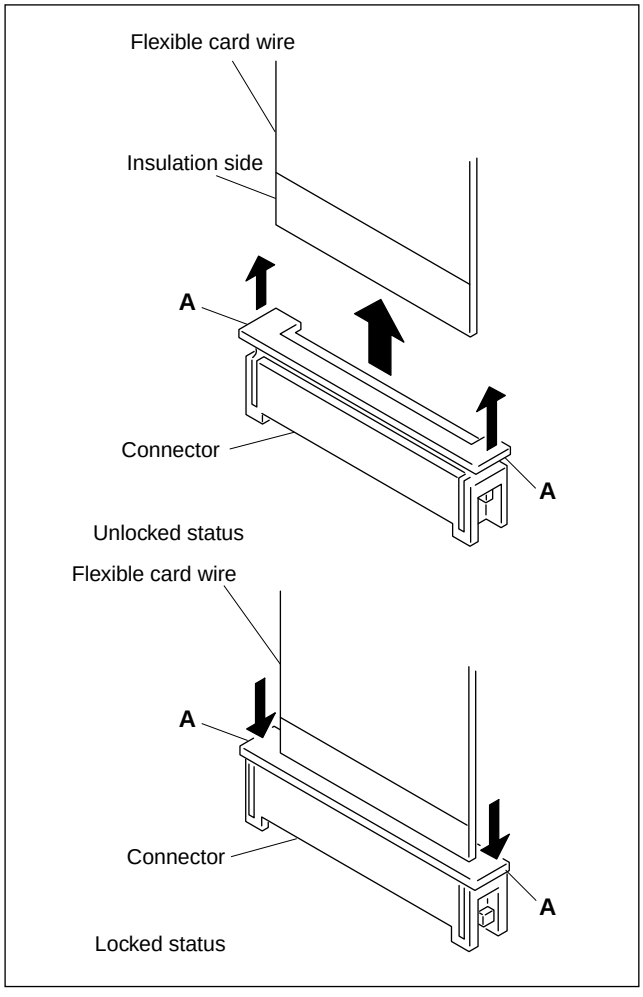
< Type C >

Removing method

Raise the portion marked "**A**" of the connector and release the lock. Pull out the flexible card wire.

Insertion method

Insert the flexible card wire fully up to the marked line and push up the portion marked "**A**" of the connector.



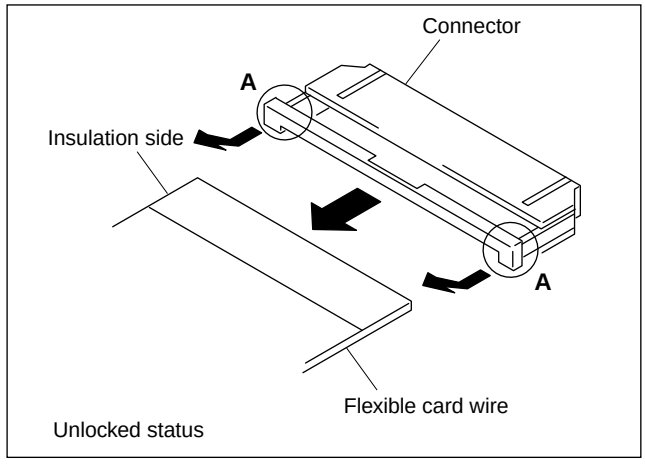
Note : The flexible card wire has the conduction side and the insulation side. Connect the flexible card wire after checking for the correct side as shown.
If the condition side and the insulation side are connected in the wrong direction, the circuit will not operate.

< Type D >

Removing method

Note :
- **Do not pull the flexible card wire before releasing the lock.**
- **The flexible card wire has the conduction side and the insulation side. Check the conduction side and the insulation side before disconnection.**

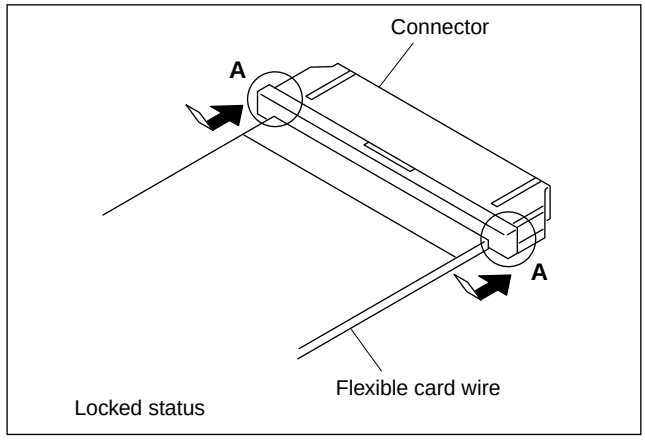
1. Move the portion "**A**" of the connector in the direction of the arrow A to release the lock. Remove the flexible card wire.



Insertion method

Note :
- **Confirm that the contacting surface of the flexible card wire is free from stain and dust.**
- **Confirm that the lock of the connector is already released.**

1. Insert the flexible card wire securely to the deep end.
2. Push in the portion marked "**A**" of the connector in the direction of the arrow to lock the connector. Be careful that the flexible card wire is not slanted with respect to the connector.

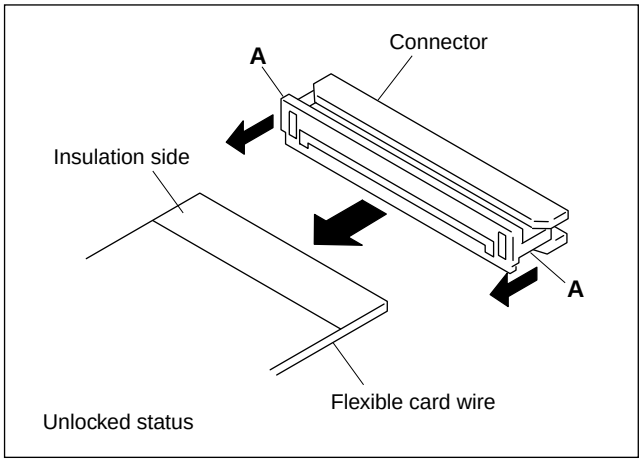


< Type E >

Removing method

Note :
- **Do not pull the flexible card wire before releasing the lock.**
- **The flexible card wire has the conduction side and the insulation side. Check the conduction side and the insulation side before disconnection.**

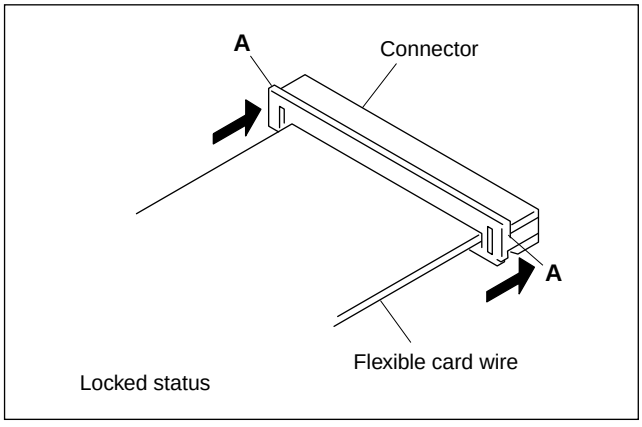
1. Move the portion "**A**" of the connector in the direction of the arrow A to release the lock. Remove the flexible card wire.



Insertion method

Note :
- **Confirm that the contacting surface of the flexible card wire is free from stain and dust.**
- **Confirm that the lock of the connector is already released.**

1. Insert the flexible card wire securely to the deep end.
2. Push in the portion marked "**A**" of the connector in the direction of the arrow to lock the connector. Be careful that the flexible card wire is not slanted with respect to the connector.

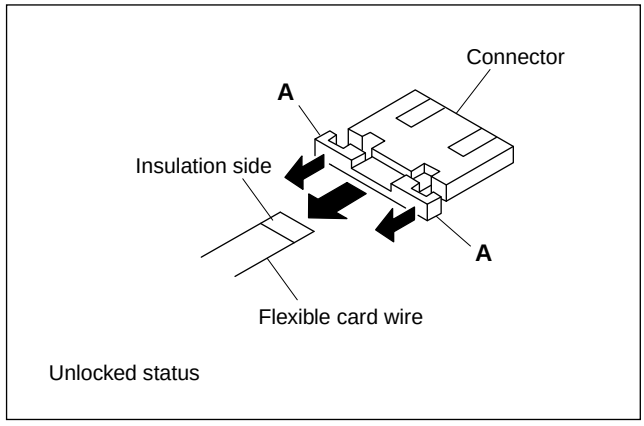


< Type F >

Removing method

Note :
- **Do not pull the flexible card wire before releasing the lock.**
- **The flexible card wire has the conduction side and the insulation side. Check the conduction side and the insulation side before disconnection.**

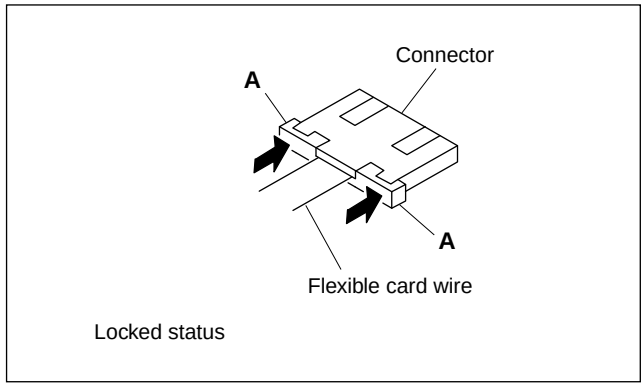
1. Move the portion "**A**" of the connector in the direction of the arrow A to release the lock. Remove the flexible card wire.



Insertion method

Note :
- **. Confirm that the contacting surface of the flexible card wire is free from stain and dust.**
- **. Confirm that the lock of the connector is already released.**

1. Insert the flexible card wire securely to the deep end.
2. Push in the portion marked "**A**" of the connector in the direction of the arrow to lock the connector. Be careful that the flexible card wire is not slanted with respect to the connector.



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2-17-2. EEPROM Initialization and Adjustment Procedure

This section describes initialization and adjustment procedure of the EEPROMs that require data initialization and adjustment after they are replaced.

Board Name	Ref. No.	Address	IC Type	Content
SE-463	IC1		EEPROM	Servo data, hours meter data, SETUP
RP-105	IC203	G2 (side A)	EEPROM	RP board adjustment data

2-17-2-1. Initialization and Adjustment Procedure

The data initialization procedure and adjustment method when the adjustment and setup data are lost due to IC replacement etc., are described as follows.

1. SE-463 board/IC1

Note : The hours meter data cannot be restored because the hours meter data is automatically initialized.

(1) Set the SETUP menu data again. (Refer to the Operation Manual supplied with the DSR-70/70P.)
(2) Perform the following items of adjustment in the maintenance mode.
- Capstan adjustment
- S-REEL adjustment
- T-REEL adjustment
- TENSION adjustment
- Switching position adjustment

(3) Initialize the resettable hours meter. (Refer to section “5-2. HOURS METER”.)

2. RP-105 board/IC203

(1) Perform the following items of adjustment in the maintenance mode.
- INITIALIZE
- PLL F0
- DVCAM EQ ADJ
- DV EQ ADJ

2-18. SYSTEM PHASE ADJUSTMENT WHEN EXTERNAL EDITING CONTROL UNIT IS CONNECTED

When an analog composite signal is input to the VIDEO REF. IN and the VIDEO INPUT connectors on the connector panel of the DSR-70/70P, confirm that SC-H specification of the input signal meets the required specifications before input.

When the system phase adjustment of the DSR-70/70P is required.

Adjust the system sync phase using RV100 (B-1) on the DEN-12/DEN-12P board. Adjust the subcarrier phase using RV101 (C-1) on the DEN-12/DEN-12P board. (Refer to section “8-2-2. Video Adjustment”.)

SECTION 3
ERROR MESSAGES

3-1. ALARM DISPLAY

The DSR-70/70P has an alarm display function.
When a problem is detected, an alarm is displayed immediately in the timer counter block. The alarm and a message describing the countermeasure are displayed on a LCD monitor.
The DSR-70/70P has two types of alarms: one is for operators while the other is for service persons. This manual describes only the alarms for service persons. For details of alarms for operators, refer to the operating instruction or overview in this manual. Activating the alarm display may influence the system, such as when the reference video signal is not used. Therefore, you can select whether or not to display the alarm from the Setup menu selection. However, the alarms for service persons are displayed regardless of the Setup menu setting.

3-1-1. Alarm Display when the Main Power is Turned On

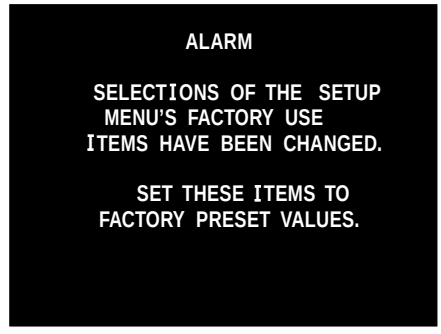
Detection : Checks the settings of switch S201 on the SY-269 board and the contents of non-volatile memory (EEPROM).
Operation after detection : None
Display : The alarm is displayed until any key is pressed.

Detection : Checks the version of the Setup menu.
Operation after detection : The Setup menu operates using the factory settings. The contents of the non-volatile memory (EEPROM) remain unchanged. Therefore, if the setting of the Setup menu is not changed, the same alarm will appear when the main power is turned on.
Display : The alarm is displayed until any key is pressed.

Detection : Checks that switch S101 on the SV-203 board is set to ON.
Operation after detection : None
Display : The alarm is displayed until any key is pressed.

ADJ. mode!

Detection : Checks that the FACTORY USE item of the Setup menu is changed.
Operation after detection : None
Display : The alarm is displayed until any key is pressed.



FACT. USE!

3-2. ERROR CODES

The DSR-70/70P has a self diagnostics function which detects internal abnormalities. When a problem is detected, an error code is displayed immediately in the time counter block, and details of the error appear on the LCD monitor.

Note : An error code appears in the column shown by XX-XXX on the display.

When detected, some errors turn the DSR-70/70P to AUTO OFF. (See from page 3-8 of item “3-2-3. Error Codes”, excluding error code 08-032.)
This error is kept in memory even after the main power of the DSR-70/70P is turned off. In other words, the error code or the contents of the detected error appear even when the main power of the DSR-70/70P is turned off and then back on again, so the DSR-70/70P enters AUTO OFF mode again.

The machine enters the emergency EJECT mode when the [EJECT] key is pressed at this moment. In the emergency EJECT mode, the tape is ejected gently by the motor (if working) assuming that the tape is slack or a device may be faulty.

The following message appears on the LCD monitor when the machine enters the emergency EJECT mode.
The error code is displayed on the time counter.

The message shown to the right appears on the LCD monitor when a cassette tape is ejected in the emergency EJECT mode.
The error code is displayed on the time counter.

The message shown to the right appears on the LCD monitor when a cassette tape cannot be ejected with the emergency EJECT mode.
The error code is displayed on the time counter.

Perform step 2-11 when a cassette tape cannot be ejected with the emergency EJECT mode.

3-2-1. Main Codes and Sub Codes

• Main codes

The main code is a two-digit number that indicates the system which sensed the error.

Main code 0X : Servo and tape path system error
Main code 2X : Mechanism control system error
Main code 3X : Sensor error
Main code 91 : Communication system and interface system error
Main code 92 to 94 : Sync. system error
Main code 95 : Digital signal process system error and communication error with ICs

• Sub codes

The sub code is a three-digit number. Each digit has the following meaning.

When the main code is 0X or 2X :

X X X
Third digit : Error symptom
Second digit : Device which senses abnormality
First digit : Mode which senses abnormality.

First digit : Mode which senses abnormality.

0 : Mode cannot be identified, or mode identification is not necessary.
1 : Cassette down mode
2 : Threading mode
3 : STOP mode
4 : F. FWD or REW mode
5 : SEARCH mode
6 : PLAY or RECORD mode
7 : STANDBY-OFF mode
8 : Unthreading mode
9 : Cassette up mode
A : Cassette out mode
(State that a cassette is ejected.)

Second digit : Device which senses abnormality

0 : Mode cannot be identified, or mode identification is not necessary.
1 : Cassette up/down motor/sensor
2 : Threading motor/FG/sensor
3 : Drum motor/FG
4 : Capstan motor/FG
5 : Supply reel motor/FG
6 : Supply reel brake solenoid
7 : Takeup reel motor/FG
8 : Takeup reel brake solenoid
9 : Supply and takeup reel motor/FG
A : Tension regulator
B : Pinch solenoid
C : Reel position motor/sensor

Third digit : Error symptom

0 : Mode identification is not necessary.
1 : Operation could not be completed within the specified time.
2 : Abnormal speed detected.
3 : Tape slack detected.
4 : FG cannot be detected.
5 : FG detected.
6 : Rotating direction error detected.
7 : Excessive tension detected.
8 : Abnormal current detected.
9 : The full top or full end of a tape cannot be released.
A : Retry in progress
(Unthreading and re-threading)

When the main code is 3X :

All sub codes are 000.

When the main code is 91:

X X X

Third digit : Error symptom

Second digit : CPU (microprocessor) or IC of the communication counterpart.

First digit : CPU (microprocessor) or IC which detects the abnormality.

First and second digits : CPU (microprocessor) code.

1 : System control CPU (SY-269, IC101)
2 : Keyboard u-COM (KY-433, IC204)
3 : Memory
4 : Servo main CPU (SV-203, IC1)
5 : Servo sub u-COM (DR-364, IC1)
6 : TBC u-COM (DEN-12, IC205)
7 : SPCON CPU (SY-269, IC301)
8 : TC IC (SY-269, IC506)
9 : DP u-COM (DP-281, IC101)
C : PP u-COM (PP-55, IC301)
D : DV I/F u-COM (DV-19, IC401)
E : QSDI I/F u-COM (SDI-39, IC604)
F : SDI OUT u-COM (SDI-38, IC401)

Third digit : Error symptom (when the communication counterpart is other than memory)

1 : Abnormal checksum
2 : Abnormality of overrun
3 : Abnormal parity
4 : Abnormal framing
5 : Communication could not be completed in the specified time.
6 : Abnormality in the servo adjustment data area of EEPROM
7 : Abnormality in the setup menu area of EEPROM
8 : Abnormality in the hours meter area of EEPROM

Third digit : Error symptom (when the communication counterpart is memory)

1 : Abnormality in the external memory area
2 : Abnormality in the internal memory area
3 : Abnormality in the common memory-1 area
4 : Abnormality in the common memory-2 area
5 : Abnormality in the external serial memory-1 area
6 : Abnormality in the external serial memory-2 area
7 : Abnormality in the external serial memory-3 area
8 : Abnormality in the external serial memory-4 area
9 : Abnormality in the EEPROM area
A : Abnormality in the NVRAM area
F : Abnormality of MIC

When the main code is from 92 to 94 :

X X X

Third digit : Abnormal signal

Second digit : IC to which the signal is input

First digit : CPU (microprocessor) which detects the abnormality

. . . . .Same as the main code 91

Third digit : Abnormal signal

1 : Reference frame pulse of the output signal (RSG OE)
2 : Reference track pulse of the playback side (P-TRKT1)
3 : Reference frame pulse of the playback side (P-FLTT1)
4 : Reference track pulse of the record side (R-TRKT1)
5 : Reference frame pulse of the record side (R-FLTT1)

When the main code is 95 :

X X X

Second and third digits : IC of the communication counterpart. (The second digit indicates the communication line number and the third digit indicates the CS number.)

First digit : CPU (microprocessor) or IC which detects the abnormality.

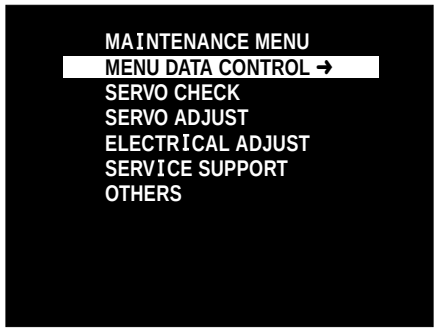
. . . . .Same as the main code 91

3-2-2. Display of Previously Detected Error Codes

When the DSR-70/70P detects an internal abnormality, the error code is memorized in EEPROM.
(Excluding error code 9X-XXX)
A maximum of 8 error codes detected previously, starting from the latest error code, can be displayed.

The error code history can be displayed.

1. While pressing the [IN] key, press the [MENU] key.



2. Move the cursor to SERVICE SUPPORT so that the letters are highlighted using the [ENTRY], [AUTO EDIT] keys, then press the [OUT] key.

3. The display changes as shown to the right, and the error history appears.

3-2-3. Error Codes

・ Main code 0X : abnormality of servo and tape path system

① Main code 02

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
058	Detected an abnormal current in the S reel motor.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette tape is inserted.
068	Detected an abnormality of reel brake plunger solenoid.			
078	Detected an abnormal current in the T reel motor.			
0B8	Detected an abnormality of pinch plunger solenoid.	Cassette tape insertion and unthreading are prohibited until the error is solved.		Displayed until the error is solved.
154	Failed to detect the S reel FG by the FG check during cassette tape insertion.	AUTO OFF	–	Displayed until the next cassette tape is inserted.
174	Failed to detect the T reel FG by the FG check during cassette tape insertion.			
194	Failed to detect both S and T reel FGs by the FG check during cassette tape insertion.			
254	Failed to detect the S reel FG during threading.		EJECT (Emergency EJECT)	
255	Detected the S reel FG during threading.			
274	Failed to detect the T reel FG during threading.			
275	Detected the T reel FG during threading.			
291	Failed to complete winding a tape.			
355	Detected the S reel FG during STOP and STILL.			
375	Detected the T reel FG during STOP and STILL.			
395	Detected both S and T reel FGs during STOP and STILL.			
402	Detected an abnormal tape speed during F. FWD and REW.	STOP	The machine operates normally after the error is solved.	Displayed until any key is pressed.
403	Detected slack tape during F. FWD and REW.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette tape is inserted.
454	Failed to detect the S reel FG during F. FWD and REW.			
474	Failed to detect the T reel FG during F. FWD and REW.			
494	Failed to detect both S and T reel FGs during F. FWD and REW.			
496	Detected the abnormal direction of S and T reel rotation during F. FWD and REW.			
503	Detected slack tape during search.			
554	Failed to detect the S reel FG during search.			
574	Failed to detect the T reel FG during search.			
594	Failed to detect the S and T reel FGs during search.			
596	Detected the abnormal direction of S and T reel rotation during search.			
603	Detected slack tape during PLAY and REC.			
654	Failed to detect the S reel FG during PLAY and REC.			
674	Failed to detect the T reel FG during PLAY and REC.			
694	Failed to detect both S and T reel FGs during PLAY and REC.			
696	Detected the abnormal direction of S and T reel rotation during PLAY and REC.			
803	Detected slack tape during unthreading.			
854	Failed to detect the S reel FG during unthreading.			
875	Detected the T reel FG during unthreading.			
A55	Detected the S reel FG during cassette eject.	Insertion of a cassette is inhibited until the error is solved.		
A75	Detected the T reel FG during cassette eject.			
A95	Detected both S and T reel FGs during cassette eject.			

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② Main code 06

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
3A7	Detected abnomal tape tension during STOP.	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette tape is inserted.
4A7	Detected abnomal tape tension during F.FWD/REW.			
5A7	Detected abnomal tape tension during SEARCH.			
6A7	Detected the abnormal tape tension during PLAY and RECORD.	The mode at the time of detection is kept continued. (If the mode is PLAY, PLAY continues.) If mode is changed to other than PLAY and RECORD, machine enters AUTO OFF.	The machine operates normally after the error is solved. The PLAY and RECORD modes continue but other modes are changed to STOP then EJECT (Emergency EJECT).	Displayed until the error is solved and any key is pressed.

③ Main code 07

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
042	Detected the abnormal capstan speed.	STOP	The machine operates normally after the error is solved.	Displayed until any key is pressed.
144	Failed to detect the capstan FG by the FG check during cassette tape insertion.	AUTO OFF	–	Displayed until the next cassette is inserted.

④ Main code 08

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
03A	Detected the abnormal drum speed. **LCD monitor display** ERROR DRUM SPEED ERROR HAS BEEN DETECTED WAIT UNTIL THIS INDICATION GOES OFF.	Retry (The mechanism unthreads once then threads again.)	EJECT	Displayed until the error is solved.
032	The abnormal drum speed error is not solved.	AUTO OFF	EJECT	Displayed until the next cassette is inserted.

⑤ Main code 09

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
010	Detected abnomal position of cassette compartment.	Cassette tape insertion and unthreading are prohibited until the error is solved.		Displayed until the error is solved.
020	Detected an abnormality of threading position sensor.			
028	Detected an abnormal current of threading motor.			
221	Failed to complete threading within the specified time	AUTO OFF	EJECT (Emergency EJECT)	Displayed until the next cassette is inserted.
224	Failed to detect the threading FG during threading.			
821	Failed to complete unthreading within the specified time			
824	Failed to detect the threading FG during unthreading.			

• Main code 2X : Abnormality related to the mechanism control

① Main code 21

Sub code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
0C8	Detected the abnormal current in the reel position motor.	Cassette tape insertion and unthreading are prohibited until the error is solved.		Displayed until the error is solved.
1C1	Failed to complete the reel position movement within the specified time.	AUTO OFF	–	Displayed until the next cassette is inserted.

• Main code 3X : Sensor trouble

Sub codes are all 000.

Main code	Detected contents	Operation after detecting an abnormality	Operable mode	Display period
31	Failed to release the tape top.	STOP	PLAY, FF, EJECT	Displayed until the error is solved and any key is pressed.
32	Failed to release the tape end.	STOP	PLAY, REW, EJECT	
33	The reel position sensor detected the large and small positions at the same time.	Insertion of cassette tape is inhibited.	–	
34	Detected an abnormality of threading sensor.	Cassette tape insertion and unthreading are prohibited until the error is solved.		
35	Detected an abnormality of cassette compartment position sensor.			
36	Detected an abnormality of fan motor.	Only error is displayed.	–	
38	Detected an abnormality of cassette compartment identification sensor.	Insertion of cassette tape is inhibited.	–	
39	Detected an abnormality of cassette top/end sensor LED.	STOP	PLAY, EJECT	
3A	Detected an abnormality of tension sensor.	AUTO OFF	EJECT (Emergency EJECT)	

• Main code 91 : Abnormality of communication system or interface system

Main code	Sub code	Detected contents
91	125	Communication error between system control and keyboard (detected by SY).
	139	System control detected abnormality of EEPROM (IC1 on the SE-463 board).
	13A	Detected abnormality in NVRAM.
	145	Communication error between system control and servo
	165	Communication error between system control and the TBC microprocessor.
	175	Communication error between system control and SPCON
	195	Communication error between system control and the DP microprocessor.
	1C5	Communication error between system control and the PP microprocessor.
	1D5	Communication error between system control and the DV microprocessor.
	1E5	Communication error between system control and the QSDI microprocessor.
	1F5	Communication error between system control and the SDI microprocessor.
	215	Communication error between system control and keyboard (detected by KY).
	439	Detected abnormality in the servo adjustment data area.
	455	Communication error between servo main and servo sub microprocessors.
	539	Detected abnormality in the EQ data area.
	731	SPCON detected abnormality of external RAM (IC306 and IC307 on the SY-269 board).
	732	SPCON detected abnormality of internal RAM.
	733	SPCON detected abnormality of the communication IC (IC308 on the SY-269 board) with SY.
	735	SPCON detected abnormality of serial communicatin IC1 (IC407 on the SY-269 board).
	736	SPCON detected abnormality of serial communicatin IC2 (IC402 on the SY-269 board).
	D39	The DV microprocessor detected abnormality of EEPROM (IC409 on the DV-19 board).

• Main code 92 to 94 : Abnormality of sync system

Main code	Sub code	Detected contents
92	101	System control detected abnormality in RSG OE.
	102	System control detected abnormality in P-TRKT1.
	702	SPCON detected abnormality in P-TRKT1.
	703	SPCON detected abnormality in P-FLTT1.
	704	SPCON detected abnormality in R-TRKT1.
	705	SPCON detected abnormality in R-FLTT1.
93	403	The servo main microprocessor detected abnormality of P-FLTT1.
	503	The servo sub microprocessor detected abnormality of P-FLTT1.
94	405	The servo main microprocessor detected abnormality of R-FLTT1.
	505	The servo sub microprocessor detected abnormality of R-FLTT1.

• Main code 95 : Communication error with digital process system IC

Main code	Sub code	Detected contents
95	126	Communication error between system control and CTLG-sub (IC303 on the PPR-11 board).
	511	Communication error between servo sub microprocessor and CHCD-P (IC101 on the RP-105 board).
	521	Communication error between servo sub microprocessor and CHCD-R (IC102 on the RP-105 board).
	711	Communication error between SPCON and SFY-P (sp) (IC100 on the DAP-21 board).
	712	Communication error between SPCON and SFY-P (ms) (IC100 on the DAP-21 board).
	713	Communication error between SPCON and F1-P (IC606 on the PPR-11 board).
	714	Communication error between SPCON and V1-P (IC604 on the PPR-11 board).
	715	Communication error between SPCON and JOG (IC400 on the DAP-21 board).
	721	Communication error between SPCON and A1-P1 (F) (IC402 on the PPR-11 board).
	722	Communication error between SPCON and A1-P2 (F) (IC403 on the PPR-11 board).
	723	Communication error between SPCON and A1-P1 (T) (IC402 on the PPR-11 board).
	724	Communication error between SPCON and A1-P2 (T) (IC403 on the PPR-11 board).
	725	Communication error between SPCON and FsCont-P (IC407 on the PPR-11 board).
	726	Communication error between SPCON and DSP-P1 (IC504 on the PPR-11 board).
	727	Communication error between SPCON and DSP-P2 (IC506 on the PPR-11 board).
	731	Communication error between SPCON and SFY-R (sp) (IC210 on the RPR-11 board).
	732	Communication error between SPCON and SFY-R (ms) (IC210 on the RPR-11 board).
	733	Communication error between SPCON and F1-R (IC501 on the RPR-11 board).
	734	Communication error between SPCON and V1-R (IC503 on the RPR-11 board).
	735	Communication error between SPCON and UVIC (IC610 on the RPR-11 board).
	741	Communication error between SPCON and A1-R1 (F) (IC407 on the RPR-11 board).
	742	Communication error between SPCON and A1-R2 (F) (IC408 on the RPR-11 board).
	743	Communication error between SPCON and A1-R1 (T) (IC407 on the RPR-11 board).
	744	Communication error between SPCON and A1-R2 (T) (IC408 on the RPR-11 board).
	745	Communication error between SPCON and FsCont-R (IC410 on the RPR-11 board).
	746	Communication error between SPCON and DSP-R (IC404 on the RPR-11 board).
	751	Communication error between SPCON and A1-Q1 (F) (IC302 on the SDI-39 board).
	752	Communication error between SPCON and A1-Q2 (F) (IC303 on the SDI-39 board).
	753	Communication error between SPCON and A1-Q1 (T) (IC302 on the SDI-39 board).
	754	Communication error between SPCON and A1-Q2 (T) (IC303 on the SDI-39 board).
	755	Communication error between SPCON and FsCont-Q (IC308 on the SDI-39 board).
	756	Communication error between SPCON and QSDI-R (IC202 on the SDI-39 board).
	757	Communication error between SPCON and QSDI-P (IC402 on the SDI-39 board).
	758	Communication error between SPCON and DV-PLD (IC210 on the DV-19 board).

3-2-4. Possible Causes of Errors

• Possible causes of errors

Main code	02												06
Sub code / Possible causes	403 503 603	574 674 803	554 654	402 454 474	355 375	058 078	154 174 194 255 275 875 A55 A75 A95	254 854	594 694	494	395	496 596 696	3A7 4A7 5A7 6A7
1. Tape is stuck to the tape running mechanism.	○	○	○	○				○		○			○
2. Tape is loosely wound in the cassette.	○	○	○	○	○						○	○	
3. Cassette tape is not confined properly. (Cassette compartment is unlocked.)	○	○	○	○				○	○	○	○	○	
4. Reel motor does not generate the correct torque.	○	○	○	○	○	○	○	○	○	○	○	○	○
5. Abnormality of reel FG	○	○	○	○	○		○	○	○	○	○	○	○
6. Tension regulator is defective.	○												
7. Cut-and-spliced tape is used.		○	○		○				○		○	○	
8. Top detector and end detector are defective.			○	○					○	○			○
9. Pinch roller has insufficient pressure against capstan.									○			○	

• Check procedure for the possible causes, and the related circuit boards and devices

Possible causes	Check items and check procedure	Related circuit boards and devices
1. Tape is stuck to the tape running mechanism. • Tape is dirty. • Tape run mechanism is dirty. • Humidity or condensation	• Check if tape is stuck to tape guides or drum. • Check if foreign material is adhered to tape. • Check if tape is damaged. • Check if foreign material is adhered to tape run mechanism and drum.	
2. Tape is loosely wound in the cassette. • A tape which has been used for many times, is used. • A damaged tape is used.	• Check if tape has severe non-uniform winding.	
3. Cassette tape is not confined properly. (Cassette compartment is unlocked.)	Check that the four pins of the cassette compartment are inserted into the holes of the slant table. Check that the cassette compartment retainer is securely fastened. ↓ If a cassette compartment is unlocked when a cassette compartment is inserted, exchange the cassette compartment. ↓ When a cassette compartment is lock after it is exchanged, the trouble is caused by the cassette compartment. Otherwise the trouble is caused by the defective drive circuit.	DR-364 board, SE-462 board cassette compartment

Possible causes	Check items and check procedure	Related circuit boards and devices
4. Reel motor does not generate the correct torque. • Reel brake has mechanical defect. • Reel brake solenoid is open. • Reel brake solenoid drive IC is defective. • Reel motor is defective. • Reel motor drive circuit is defective. • Harness is defective.	• When the S and T reel brakes are considered to be the cause of trouble : Check the S and T reel brakes. Check that the S and T reel brakes are released. • When the S and T reel motors are considered to be the cause of trouble : Perform the servo adjustment. Confirm that the servo adjustment is completed as intended.	When the reel brake is considered to be the cause of trouble : DR-364 board, reel brake solenoid When the S and T reel motor or the S and T reel FG is considered to be the cause of trouble : SV-203 board, DR-364 board, S and Treel motor
5. Abnormality of reel FG • S and T reel motor is defective. • S and T reel FG amp is defective.	Perform the S and T reel adjustment. Confirm that the reel FG adjustment is completed as intended.	
6. Tension regulator is defective.	Perform the position adjustment. Confirm that OK appears on display.	SV-203 board, DR-364 board, SE-462 board
7. Cut-and-spliced tape is used.		
8. Top detector and end detector are defective.	Check the tape top and tape end. The top and end sensor must turn on and off correctly.	When the tape top sensor is considered to be the cause of trouble : SE-463 board, DR-364 board, tape top sensor LED When the tape end sensor is considered to be the cause of trouble: SE-462 board, DR-364 board, tape end sensor LED
9. Pinch roller has insufficient pressure against capstan. • Pinch roller has mechanical defect. • Pinch solenoid is open. • Pinch solenoid drive IC is defective.	Check the pinch roller. Pinch roller must be pressed against the capstan shaft correctly.	DR-364 board, pinch solenoid

SECTION 4
MAINTENANCE MENU

4-1. MENU STRUCTURE

This unit has a maintenance menu which is used for maintenance.
The maintenance menu has a layered structure through which you move to perform the various checks, settings and adjustments using the specified menu items. Contents of the maintenance menu are displayed on the LCD monitor and the time counter of DSR-70/70P.

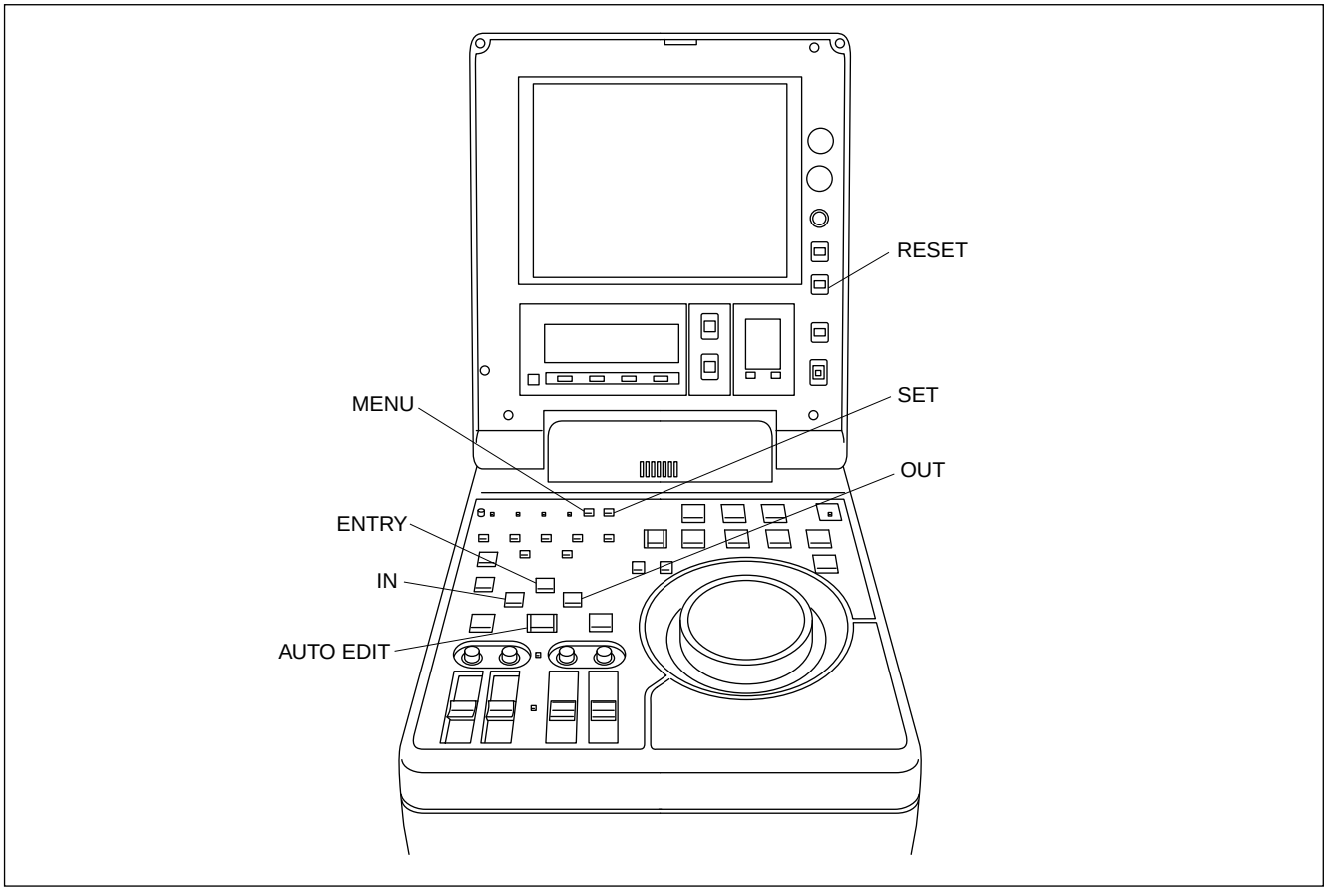
Values in parenthesis ( ) are time counter display.

MENU, First layer	MENU, Second layer	MENU, Third layer
MENU DATA CONTROL (MENU CNT)	MENU STATUS DISPLAY (>MENU STA) SAVE MENU DATA (>Save MENU) LOAD MENU DATA (>Load MENU)	
SERVO CHECK (SV Check)	SENSOR CHECK (>Sensor)	CASS-COMPARTMENT (>>Cass-COM) TAPE TOP/END (>>Top/End) HUMID [MOISTURE] (>>HUMID) REC INHIBIT (>>REC INHI.)
	MOTOR CHECK (>Motor)	S-REEL (>>S-Reel) T-REEL (>>T-Reel) THREADING (>>Threading) CAPSTAN (>> Capstan) DRUM (>>Drum) REEL POSITION (>>Reel POS.)
	PLUNGER CHECK (>Plunger)	PINCH (>>Pinch) REEL BRAKE (>>R-Brake) HEAD CLEANER (>>H. Cleaner)
SERVO ADJUST (SV Adjust)	S/T-REEL & CAPSTAN (>Reel & Cap.) S-REEL ONLY (>S-Reel) T-REEL ONLY (>T-Reel) CAPSTAN ONLY (>Capstan) TENSION (>Tension)	
TAPE PATH ADJUST (TP Adjust)	TRACKING ADJUST (>Tracking)	
	RF SWITCHING POSITION (>Switching)	X1 MANUAL (>>x1 manual) AUTO (>>Auto)
ELECTRICAL ADJUST (EL Adjust)	PLL F0 (>PLL f0)	
	DVCAM EQ ADJ (>15 um EQ)	MANUAL (>>manual) AUTO (>>Auto)
	DV EQ ADJ (>10 um EQ)	MANUAL (>>manual) AUTO (>>Auto)
	REC CURRENT (>REC cur) FE CHECK (>FE check) RP DATA INITIALIZE (>RP initial) BATTERY ADJ (>Batt adj)	
SERVICE SUPPORT (Support)	ERROR LOG (>Error LOG) MANUAL EJECT (>Manu. Eject)	
	DIAGNOSTICS CONTROL (>DIAG CNT)	CLEAR ERROR LOG (>>Clear LOG)
OTHERS (Others)	SOFTWARE VERSION (>Version) DSBK-140 SERIAL NO. (>DVIO No.)	
	MEMORY DISPLAY (>MEM Check)	SY MEMORY DISPLAY (>> SY MEM.) SV MEMORY DISPLAY (>> SV MEM.) SP MEMORY DISPLAY (>> SP MEM.) KY MEMORY DISPLAY (>> KY MEM.) CM DISPLAY (>> CM DISP.)
	DATA DISPLAY (>Data Check)	SP DATA DISPLAY (>>SP DATA)

4-2. HOW TO OPERATE MAINTENANCE MENU

4-2-1. Location and Function of Switches

Use the RESET switch on the LCD panel and the MENU, SET, ENTRY, AUTO EDIT, IN and OUT switches on the control panel shown below to run the maintenance menu.



The maintenance menu has a layered structure through which you move to select the desired item.

ENTER : Use this key to move in the direction of ↑ within the same layer.
AUTO EDIT : Use this key to move in the direction of ↓ within the same layer.
IN : Use this key to move in the direction of ← to higher layers.
OUT : Use this key to move in the direction of → to lower layers. (Ignored in the layer that has no lower layer.)

To indicate depth of layer, the displayed menu items are indented on the LCD monitor and ">" is added to the top on the time counter.

4-2-2. How to Enter the Maintenance Menu

1. While pressing the [IN] (←) key, press the [MENU] key. The DSR-70/70P enters the maintenance menu. The maintenance menu appears on the LCD monitor.
2. Select the desired item using the [ENTRY] (↑) key and the [AUTO EDIT] (↓) key. The cursor shown with a white background moves to the selected item.
3. After the desired item is selected, press the [OUT] (→) key. This sets the selected item.

4-2-3. How to Exit the Maintenance Menu

Press the [MENU] key to exit the maintenance menu.

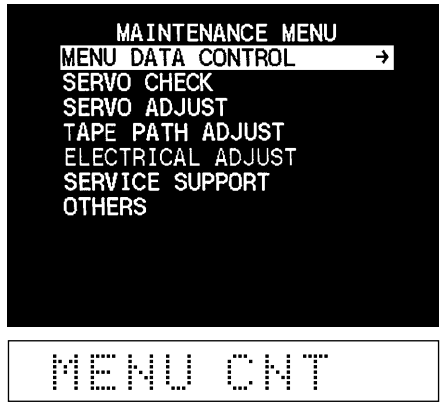
4-3. CONTENTS OF MAINTENANCE MENU

4-3-1. Menu Data Control

The MENU DATA CONTROL item provides a SETUP MENU data display and saving and loading the SET UP MENU data. This item is used to return the settings to their original values after maintenance is complete or ROM upgrading is complete.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to “MENU DATA CONTROL” which is displayed with a white background, using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



3. Press the [OUT] (→) key.
   “MENU DATA CONTROL” is selected and its lower layer submenu appears.

4. Move the cursor displayed with a white background to a desired item using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
5. When an item is selected, press the [OUT] (→) key. The contents of the selected item appear.
6. Press the [IN] (←) key to exit MENU DATA CONTROL and return to the main menu.
7. Press the [MENU] key to exit the maintenance menu.

(1) MENU STATUS DISPLAY

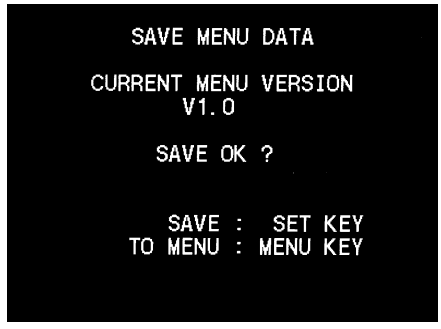
Displays the current status of the SET UP MENU data.

MENU VERSION : Version number of the SET UP MENU
NUMBER OF ITEM : Numbers of the SET UP MENU items
CHANGED ITEM : Numbers of the items which were changed from the factory default settings
DATA CHECK SUM : Data check sum

(2) SAVE MENU DATA

This is used to temporarily save the user's setup data of the SET UP MENU and set it at a later time.

1. The version number of the current SET UP MENU is displayed, and input is prompted by the [SET] key.
   * Pressing the [MENU] key returns to the main menu.



2. Press the [SET] key.
   The SET UP MENU data is stored in EEPROM.
   Confirm that [COMPLETE] appears and data saving is complete.

Notes :
- **Data which has once been saved will not be deleted by turning the main power on and off, or by upgrading the ROM version. However, the saved data is deleted when the SE-463 board or the EEPROM is replaced because the data is saved in the EEPROM in the SE-463 board.**
- **When the SET UP MENU is upgraded by ROM's version upgrade, an alarm message appears after the ROM is replaced. Either initialize the SET UP MENU or execute "LOAD MENU DATA" when the alarm appears.**

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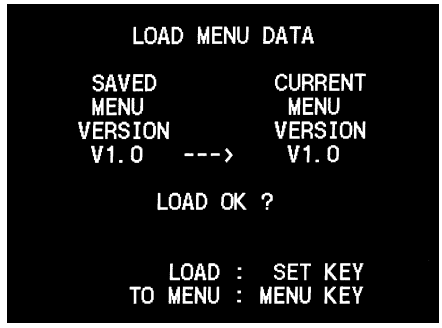
(3) LOAD MENU DATA

The saved data is stored as ordinary SET UP MENU data when it is loaded.

1. The version number of the current SET UP MENU and that of the SET UP MENU to load are displayed, and input is prompted by the [SET] key.
   * Pressing the [MENU] key returns to the main menu.



2. Press the [SET] key.
   The SET UP MENU data is stored in EEPROM.
   Confirm that [COMPLETE] appears and data saving is complete.

In case of trouble :

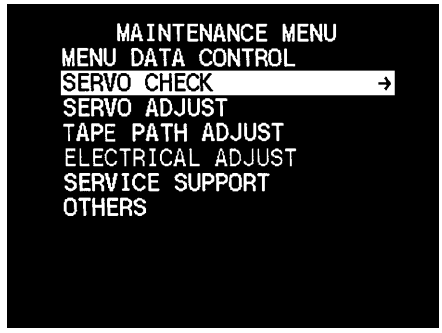
Loading of the data will not start if SET UP MENU data has not been saved or the saved SET UP MENU data contains an error.

4-3-2. Servo Check

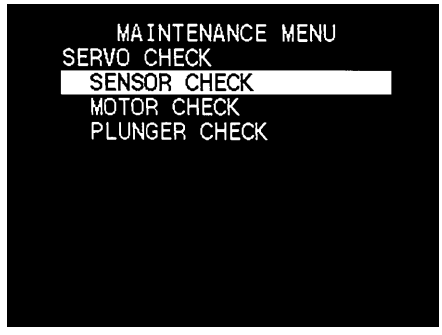
Checks the servo system automatically or semi-automatically.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to “SERVO CHECK” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

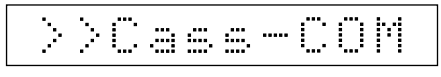


3. Press the [OUT] (→) key.
   “SERVO CHECK” is selected and its lower layer submenu appears.



4. Move the cursor displayed with a white background to a desired item using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
5. Press the [OUT] (→) key.
   The lower layer submenu appears.

6. Move the cursor displayed with a white background to a desired item using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
7. Press the [OUT] (→) key to execute the selected item.
   (Refer to the respective menu description for the check procedure after execution.)
8. After completing the check, press the [MENU] key to return to the main menu.
9. To check other menus and submenus, repeat steps 4 to 8.
10. Press the [MENU] key to exit the maintenance menu.



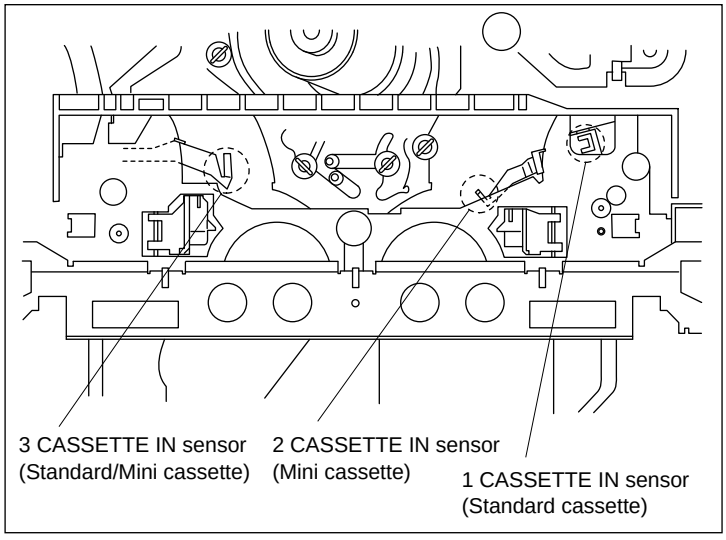
Note : If the [MENU] key is pressed while the check is in progress, the check operation is forcibly ended and the display returns to the main menu.

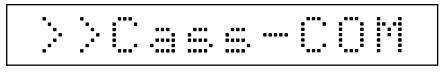
(1) SENSOR CHECK

The respective items of “SENSOR CHECK” are described below:

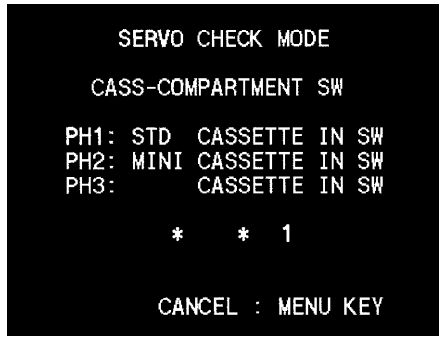
① CASS-COMPARTMENT

Checks the respective switches of the cassette compartment.



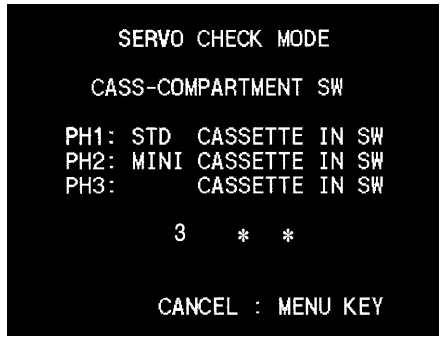


1. Press the 1 CASSETTE IN switch with your finger or the like. Confirm that “1” appears in the area shown by the asterisk on the monitor.



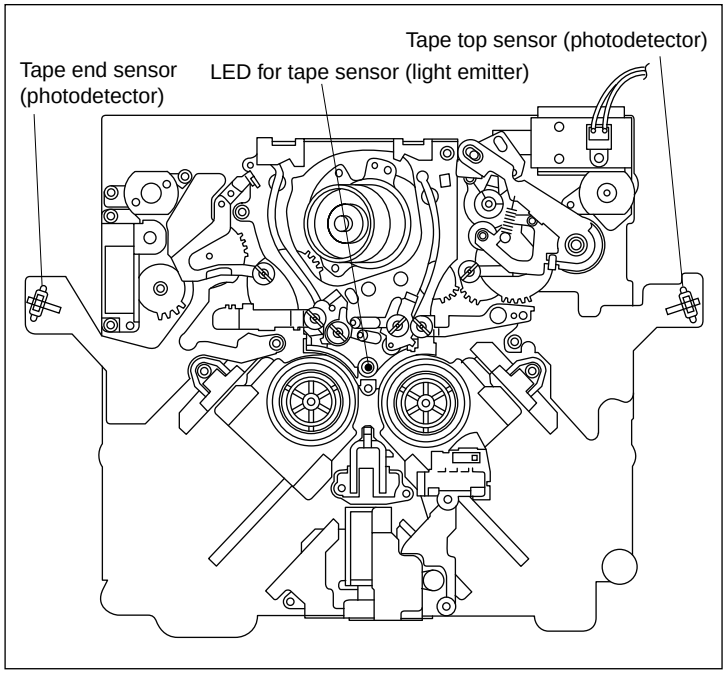
2. Press the 2 CASSETTE IN switch with your finger or the like. Confirm that “2” appears in the area shown by the asterisk on the monitor.

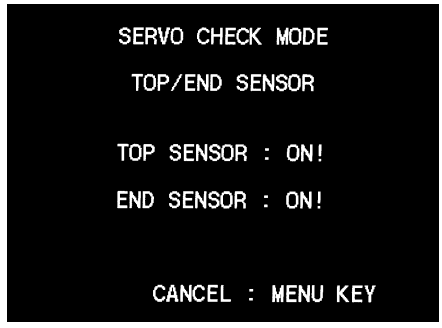
3. Press the 3 CASSETTE IN switch with your finger or the like. Confirm that “3” appears in the area shown by the asterisk on the monitor display.

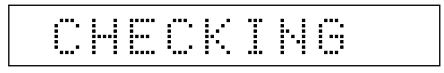


② TAPE TOP/END

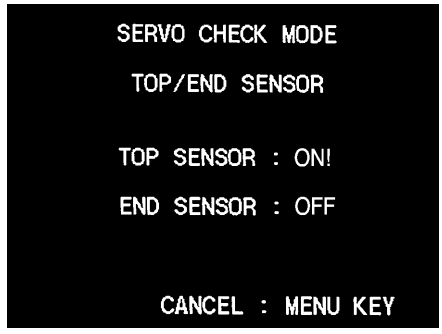
Checks the tape-top and tape-end sensors.
Pressing the [SET] key moves down the cassette compartment and the display shown in the right appears.







1. Interrupt the LED light by inserting a finger or the like between the light emitter and photodetector of the tape-top sensor. Confirm that the TOP SENSOR display changes from [OFF] to [ON!] on the monitor display.

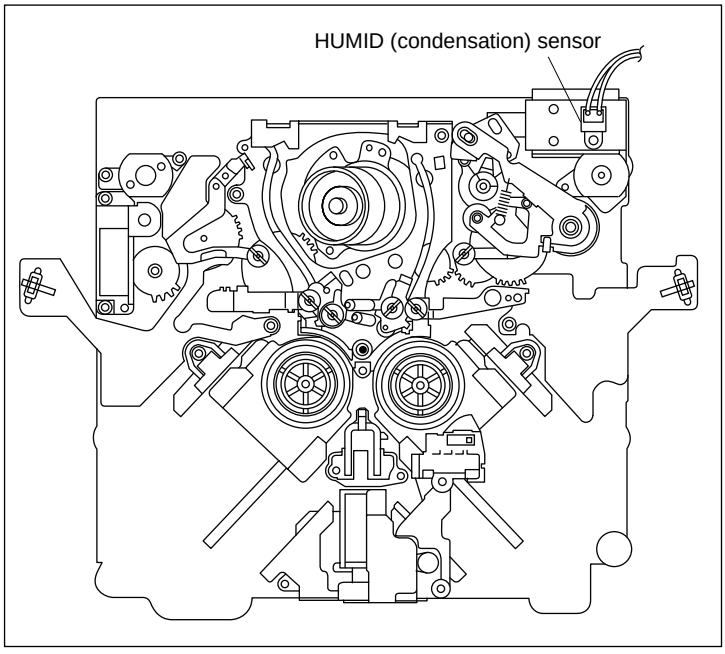


2. Interrupt the LED light by inserting a finger or the like between the light emitter and photodetector of the tape-end sensor. Confirm that the END SENSOR display changes from [OFF] to [ON!] on the monitor display.

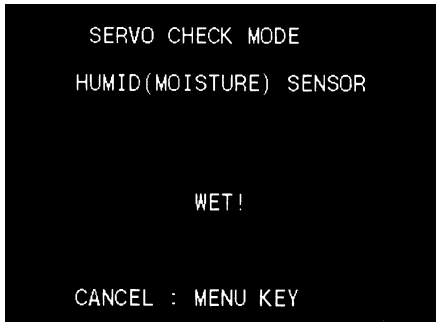
In case of trouble :
If the display does not change from OFF to ON, check whether the tape-top sensor or the tape-end sensor itself is defective.
Check also the tape-top/tape-end sensor circuit (DR-364, SE-462/463/464 board).

③ HUMID (MOISTURE)

Checks the HUMID (condensation) sensor.



1. Bring a cotton swab moistened with water in contact with the HUMID sensor.
   Confirm that [DRY] changes to [WET!] on the monitor display.



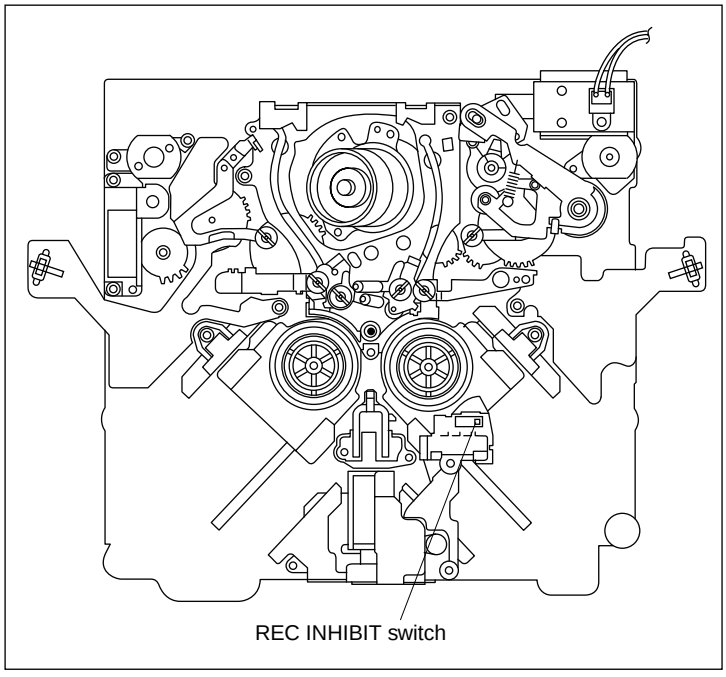
2. Blow wind onto the HUMID sensor to evaporate any water.
   Confirm that the display changes to [DRY] on the monitor.

In case of trouble :

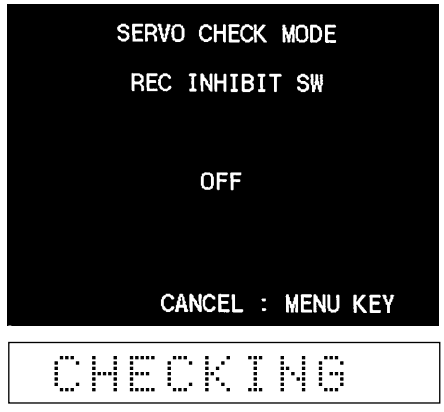
If the display does not change from DRY to WET!, check whether the HUMID sensor itself is defective.
Check also the HUMID sensor amplifier (DR-364 board).

④ REC INHIBIT

Checks the REC INHIBIT switch.



1. Press the REC INHIBIT switch.
   Confirm that OFF is displayed on the monitor display.

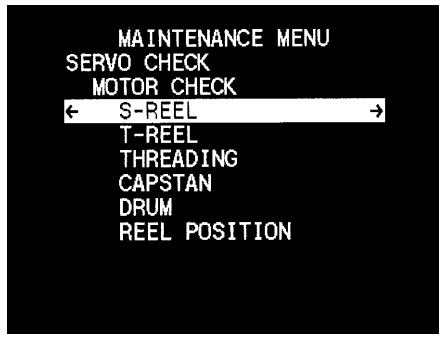


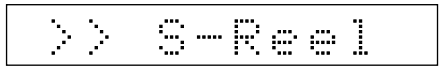
In case of trouble :

If OFF is not displayed, check the sensor on the MIC arm board.

(2) MOTOR CHECK

The respective items of “MOTOR CHECK” are described below :





① S-REEL

Checks the S-reel motor.

Select the S REEL MOTOR from the submenu and press the [SET] key. Press the [ENTRY] (↑) then [AUTO EDIT] (↓) keys (note: keep pressing for one to two seconds) to turn the S reel motor in the FWD then REV directions. Confirm that the S reel motor rotates in the specified direction while pressing the [ENTRY] (↑) or [AUTO EDIT] (↓) key after releasing the reel brake by activating the brake solenoid.

In case of trouble :
If the brake solenoid does not operate or the S reel motor does not rotate in the specified direction with the key pressed, check the S reel motor assembly and the reel motor driver circuit (SV-203 board, DR-364 board).

② T-REEL

Checks the T-reel motor.

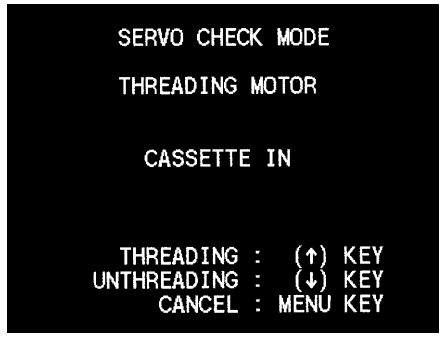
Select the T REEL MOTOR from the submenu and press the [SET] key. Press the [ENTRY] (↑) then [AUTO EDIT] (↓) keys (note: keep pressing for one to two seconds) to turn the T reel motor in the FWD then REV directions. Confirm that the T reel motor rotates in the specified direction while pressing the [ENTRY] (↑) or [AUTO EDIT] (↓) key after releasing the reel brake by activating the brake solenoid.

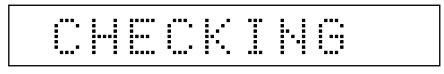
In case of trouble :
If the brake solenoid does not operate or the T reel motor does not rotate in the specified direction with the key pressed, check the T reel motor assembly and the reel motor driver circuit (SV-203 board, DR-364 board).

③ THREADING

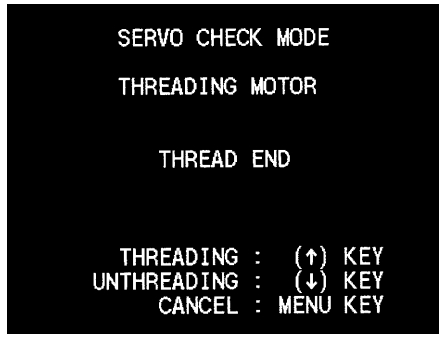
Checks the threading motor, the thread-end sensor, unthread-end sensor and the cassette compartment.

1. Press the [SET] key.
2. Close the cassette compartment and confirm that the message CASSETTE IN appears on monitor.

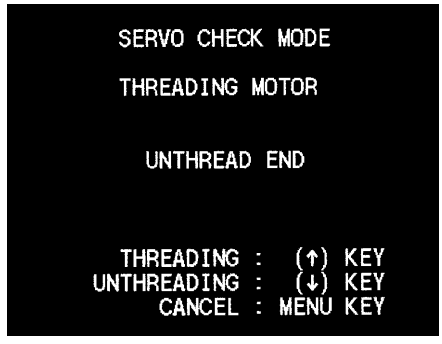




3. Keep pressing the [ENTRY] (↑) key to rotate the threading motor in the FWD direction. Confirm that the threading ring completes threading and the message THREAD END appears on monitor.



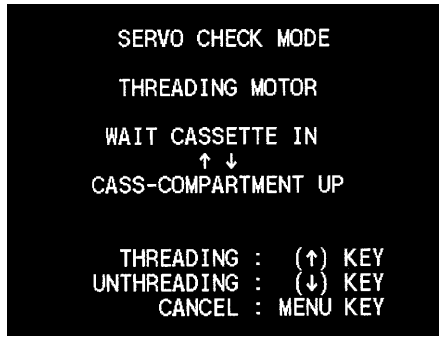
4. Keep pressing the [AUTO EDIT] (↓) key to rotate the threading motor in the REV direction.
   Confirm that the threading ring completes unthreading and UNTHREAD END appears on the monitor display.
5. If the DSR-70/70P has a cassette compartment, keep pressing the [AUTO EDIT] (↓) key to open the cassette compartment. (CASS-COMPARTMENT UP)
6. Press the [ENTRY] (↑) key and confirm that the message WAIT CASSETTE IN appears on monitor.



In case of trouble :

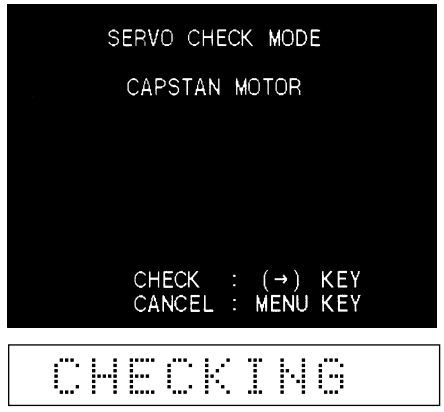
If the threading motor does not rotate, or if the message "THREAD END" does not appear even though threading is complete, or if the message "UNTHREAD END" does not appear on monitor even though the unthreading is complete, check the threading motor, the cassette compartment, the sensor on the SE-462 board. Check also the driver circuit on the DR-364 board and the threading FG amplifier circuit.

Note : Do not attach the cassette compartment to the unit working in this mode because it is not appropriate mode to attach the cassette compartment even though the message [UNTHREAD END] appears.

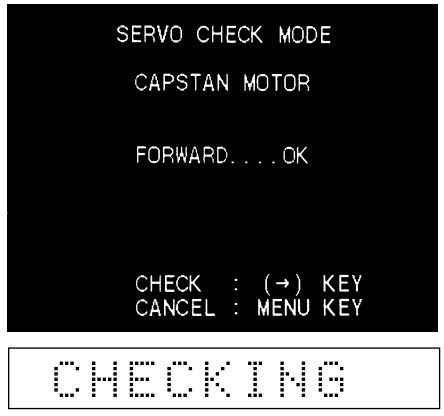


④ CAPSTAN

Checks the capstan motor.
Select CAPSTAN MOTOR and press the [SET] key.



1. Press the [OUT] (→) key.
   Confirm that [FORWARD ... OK] appears on the monitor display.



2. Press the [OUT] (→) key again.
   Confirm that [REVERSE ... OK] appears on the monitor display.

In case of trouble :

If the monitor display does not change, check the capstan motor and the capstan motor driver circuit (SV-203 board, DR-364 board)

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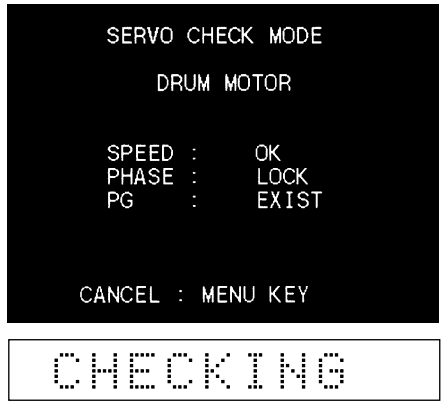
⑤ DRUM

Checks the drum motor.

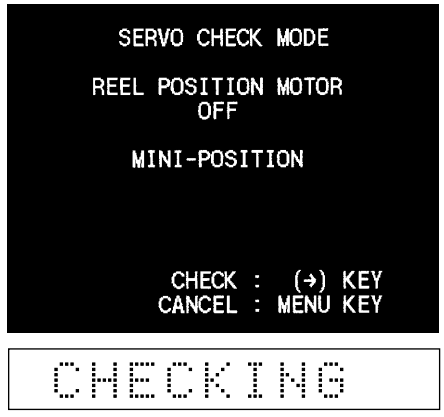
When the [SET] key is pressed, confirm the following:
SPEED : The monitor display changes to [OK].
PHASE : The monitor display changes to [LOCK].
PG : The monitor display changes to [EXIST].



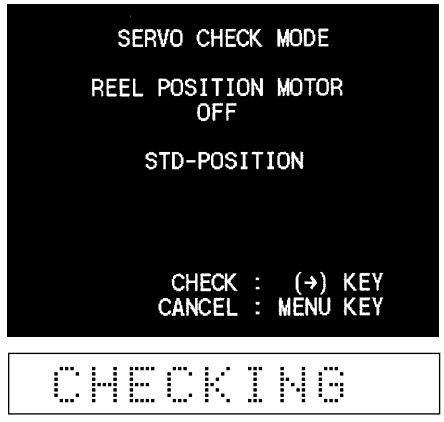
In case of trouble :
If the monitor display does not change, check the drum motor, the drum motor driver circuit, the drum FG amp circuit and the drum PG amp circuit. (DR-364 board)

⑥ REEL POSITION

Checks the reel position motor and the reel MINI/STD position sensor.



Press the [SET] key, then press the [OUT] (→) key.
Confirm that the reel table moves from the MINI position to the STD position and the monitor display changes.

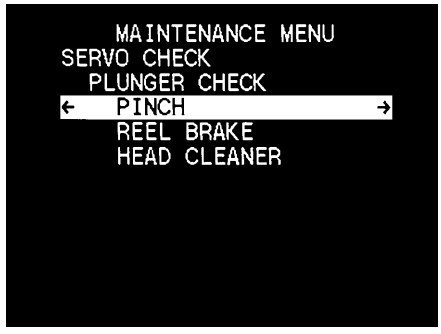


In case of trouble :

If the reel table does not move or the monitor display does not change, check the reel position motor, the reel MINI/STD position sensor (SE-463 board) and reel position motor driver circuit (DR-364 board).

(3) PLUNGER CHECK

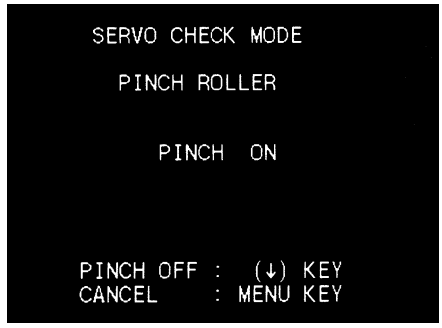
The respective items of “PLUNGER CHECK” are described below.

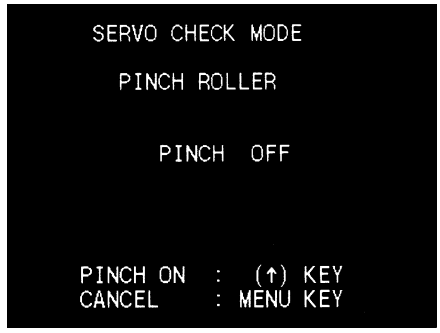


① PINCH

Checks the pinch roller solenoid.

Pressing the [SET] key starts threading and activates the pinch solenoid.
Pressing the [MENU] key releases the pinch solenoid and starts unthreading. The monitor display returns to the main menu.





In case of trouble :
If the pinch solenoid does not operate, check the pinch solenoid and the driver circuit (DR-364 board).

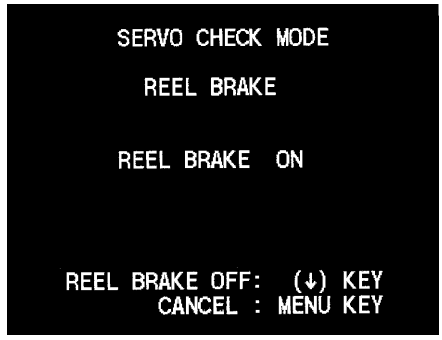
② REEL BRAKE

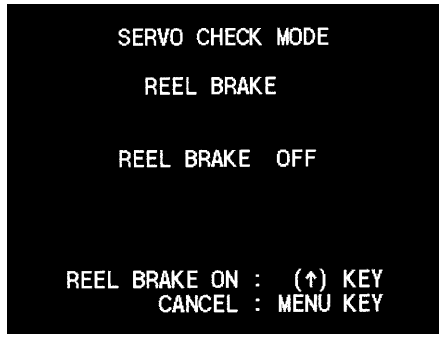
Checks the reel brake solenoid.

1. Pressing the [SET] key activates the reel brake solenoid.

2. Pressing the [MENU] key releases the reel brake solenoid. The monitor display returns to the main menu.

In case of trouble :
If the reel brake solenoid does not operate, check the reel brake solenoid and its driver circuit (DR-364 board).



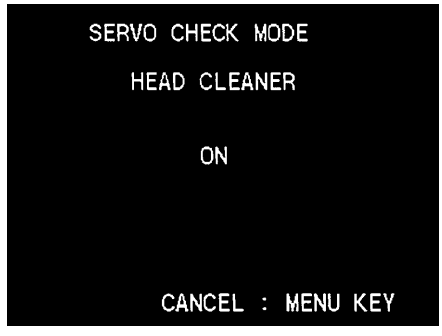


③ HEAD CLEANER

Checks the head cleaner solenoid only when the head cleaner is attached.

1. Pressing the [SET] key activates the head cleaner.
2. Pressing the [MENU] key releases the head cleaner. The monitor display returns to the main menu.

In case of trouble :
If the head cleaner solenoid does not operate, check the head cleaner solenoid and its driver circuit (DR-364 board).



4-3-3. Servo Adjust

Checks the servo system automatically or semi-automatically.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to “SERVO ADJUST” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

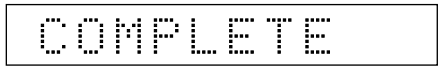
3. Press the [OUT] (→) key.
   “SERVO ADJUST” is selected and its lower-layer submenu appears.

4. Move the cursor displayed with a white background to a desired item using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
5. Press the [OUT] (→) key to execute the selected item. (Refer to the respective menu description for the adjustment procedure after execution.)
6. After completing the adjustment, press the [IN] (←) key to return to the main menu.
7. To check other menus and submenus, repeat steps 4 to 6.
8. Press the [MENU] key to exit the maintenance menu.

Note : If the [MENU] key is pressed while the adjustment is in progress, the adjustment operation is forcibly ended and the display returns to the main menu.

(1) S/T REEL & CAPSTAN

Executes the automatic adjustment of the S and T reels and, capstan systems.
After completing adjustment, confirm that “COMPLETE” appears.



Adjustment items

s reel fg adjust
s reel offset/friction
s reel torque
t reel fg adjust
t reel offset /friction
t reel torque
capstan fg adjust

In case of trouble :

When “ADJUST INCOMPLETE” appears on monitor display, check the reel FG amplifier circuit, reel motor driver circuit, capstan motor and capstan FG circuit/motor driver circuit. (SV-203 board, DR-364 board.) Check also the respective motors.

Note : The above procedures are applied to the units for which the SV software, Version 1.08 or higher, is installed in the SV-203 board (IC11).

(2) S-REEL ONLY

Executes the automatic adjustment of the S reel only.
After completing adjustment, confirm that “COMPLETE” appears.

Adjustment items

s reel fg adjust
s reel offset/friction
s reel torque

In case of trouble :

When “ADJUST INCOMPLETE” appears on monitor display, check the reel FG amplifier circuit, the reel motor driver circuit (SV-203 board, DR-364 board) and the S-reel motor.

Note : The above procedures are applied to the units for which the SV software, Version 1.08 or higher, is installed in the SV-203 board (IC11).

(3) T-REEL ONLY

Executes the automatic adjustment of the T reel only.
After completing adjustment, confirm that “COMPLETE” appears.

Adjustment items
t reel fg adjust
t reel offset/friction
t reel torque

In case of trouble :
When “ADJUST INCOMPLETE” appears on monitor display, check the reel FG amplifier circuit, the reel motor driver circuit (SV-203 board, DR-364 board) and the T-reel motor.

Note : The above procedures are applied to the units for which the SV software, Version 1.08 or higher, is installed in the SV-203 board (IC11).

(4) CAPSTAN ONLY

Executes the automatic adjustment of the capstan FG only.
After completing adjustment, confirm that “COMPLETE” appears.

Adjustment item
capstan fg adjust

In case of trouble :
When “ADJUST INCOMPLETE” appears on monitor display, check the capstan motor driver circuit, the capstan FG amplifier circuit (SV-203 board, DR-364 board) and the capstan motor.

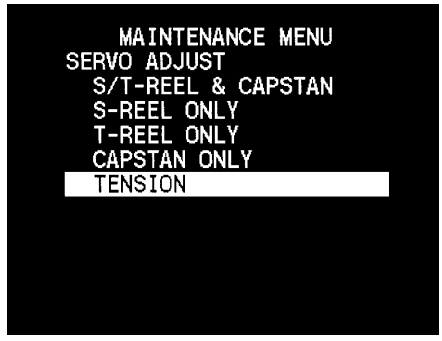
(5) TENSION

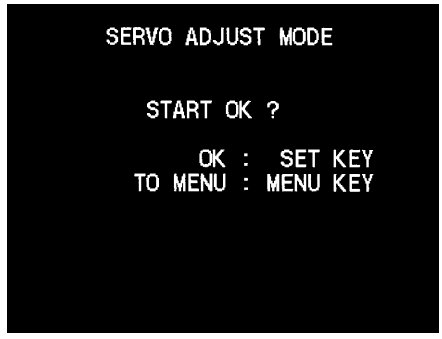
Executes the adjustment of the tape tension.

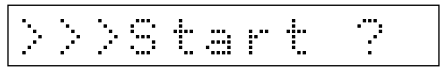
Mode
PLAY mode

Tools
DV torque cassette: J-6082-373-A

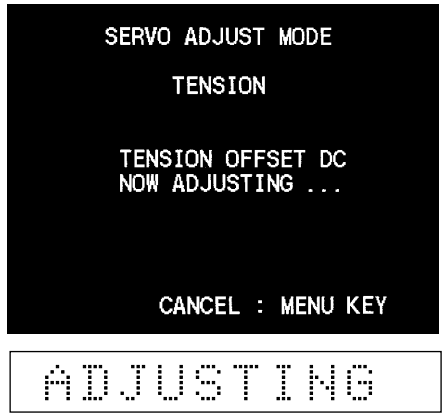
1. Remove the cassette compartment.
2. Turn on the main power and press the [EJECT] key.
   Note : Make sure that the cassette compartment connection cable is not shorted to chassis when the main power is turned on.
3. Enter "MAINTENANCE MENU" and select "TENSION" from "SERVO ADJUST" using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
4. Press the [OUT] (→) key to move to the next display.
5. When the display appears, press the [SET] key to start the adjustment.







6. Wait until display changes and the menu appears as shown in the right.

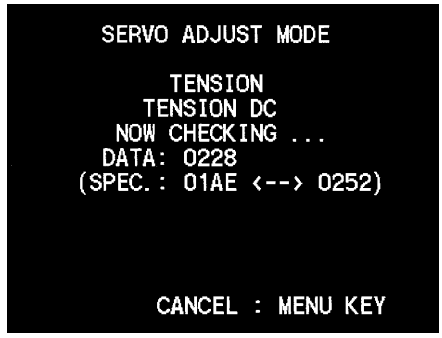


7. Set the DV torque cassette and place a weight of about 300 g on it. Press the [STOP] key.

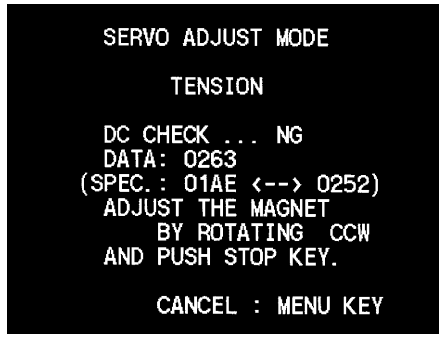
8. Keep pressing the [ENTRY] (↑), [AUTO EDIT] (↓) keys until the DV torque cassette reading agrees with the specification value on display.
9. When adjustment is completed, press the [OUT] (→) key.

Specification is as indicated on the display.

10. The display changes as shown in the right, and the DSR-70/70P enters the tension regulator magnet position check mode.



11. If the check is completed unsatisfactorily, the display changes as shown in the right.
12. Adjust the magnet position by turning the magnet as directed by the message on display, and press the [STOP] key. The display and adjustment step return to the previous step 8.



13. If the check is completed satisfactorily, the display changes as shown in the right.
14. Keep pressing the [ENTRY] (↑), [AUTO EDIT] (↓) keys until the DV torque cassette reading agrees with the specification value on display.
15. When adjustment is completed, press the [OUT] (→) key.

Specification is as indicated on the display.

16. Confirm that the DV torque cassette reading agrees with the specification value on display.
17. After completing step 16, press the [OUT] (→) key and the DSR-70/70P enters the REV mode automatically.

Specification is as indicated on the display.

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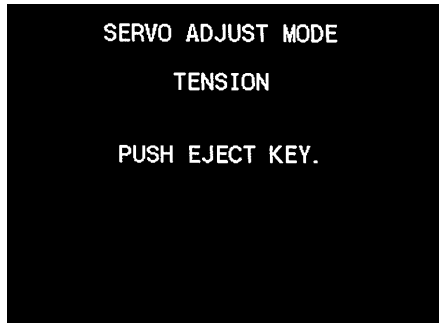
18. Keep pressing the [ENTRY] (↑), [AUTO EDIT] (↓) keys until the DV torque cassette reading agrees with the specification value on display.
19. When adjustment is completed, press the [OUT] (→) key.

Specification is as indicated on the display.

20. Press the [EJECT] key and remove the DV torque cassette.



21. Confirm that the message “COMPLETE” appears on display.

∗ When adjustment is complete, attach the cassette compartment.

Note : The above procedures are applied to the units for which the SV software, Version 1.08 or higher, is installed in the SV-203 board (IC11).

4-3-4. Tape Path Adjust

(1) TRACKING ADJUST

For adjustment of “TRACKING ADJUST”, refer to section 7-2.

(2) RF SWITCHING POSITION

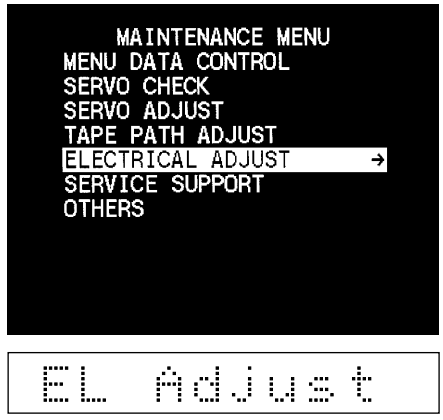
For adjustment of “RF SWITCHING POSITION”, refer to section 7-3.

4-3-5. Electrical Adjust

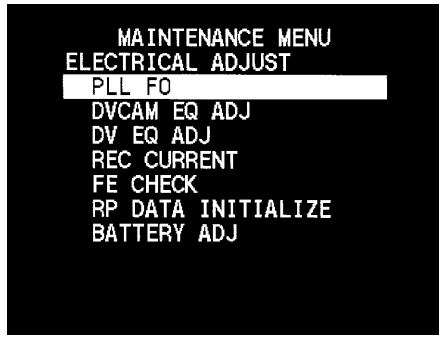
Executes the electrical adjustment.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to “ELECTRICAL ADJUST” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



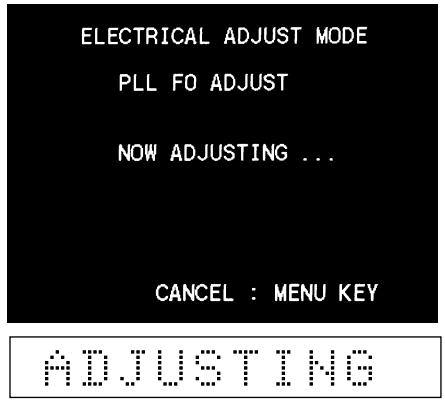
3. Press the [OUT] (→) key.
   “ELECTRICAL ADJUST” is selected and its lower-layer submenu appears.



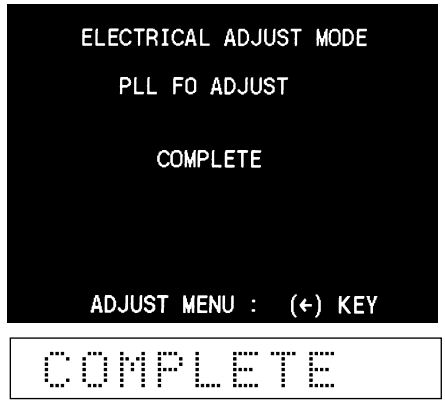
(1) PLL F0

The PLL adjustment is described below:

1. Press the [OUT] (→) key.
   "PLL F0" is selected and the adjustment is performed.



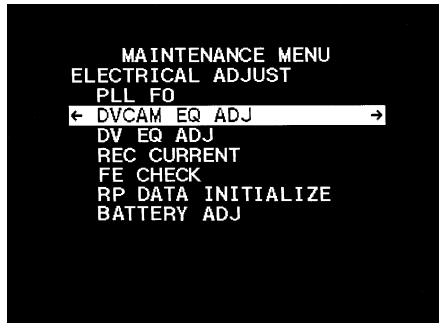
2. After completing the adjustment, confirm that "COMPLETE" appears.
3. Press the [IN] (←) key to return to the main menu.
4. Press the [MENU] key to exit the maintenance menu.

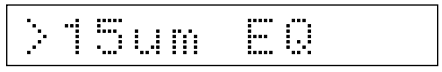


(2) DVCAM EQ ADJ

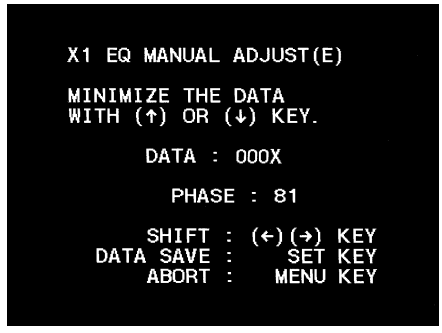
Move the cursor to “DVCAM EQ ADJ” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

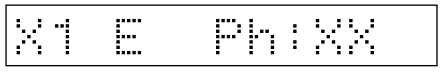
1. Press the [OUT] (→) key to enter the adjustment mode.



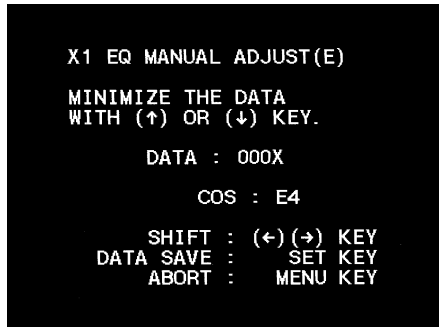


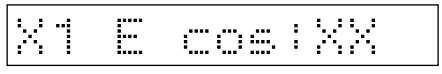
2. Playback the alignment tape XH5-1A2/XH5-1AP2. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select PHASE with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



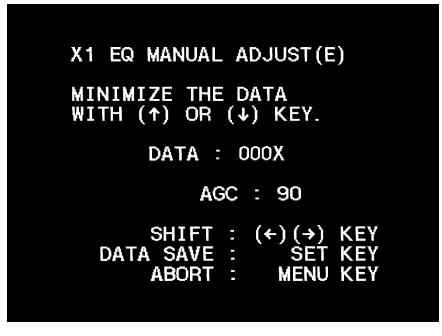


3. Playback the alignment tape XH5-1A2/XH5-1AP2. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select COS with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

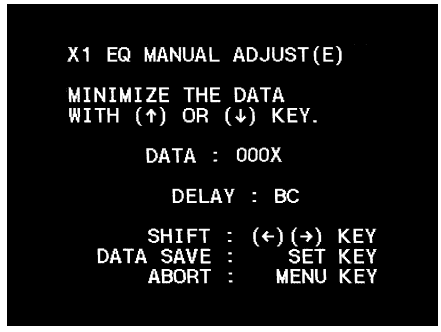




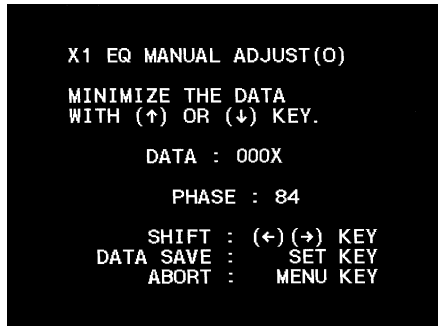
4. Playback the alignment tape XH5-1A2/XH5-1AP2. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select AGC with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



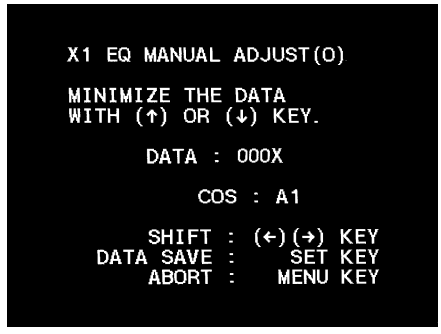
5. Playback the alignment tape XH5-1A2/XH5-1AP2. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select DELAY with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

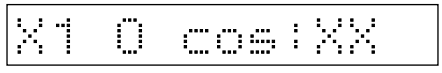


6. Playback the alignment tape XH5-1A2/XH5-1AP2. Select “O” in the parentheses ( ) in the top right with the [OUT] (→) key and select PHASE with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



7. Playback the alignment tape XH5-1A2/XH5-1AP2. Select “O” in the parentheses ( ) in the top right with the [OUT] (→) key and select COS with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.





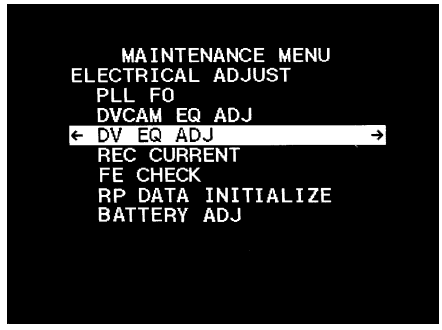
8. When the adjustment of the above described items are complete, press the [SET] key to save the adjustment data.

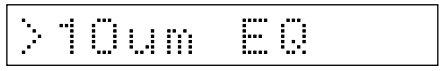
Note : The alignment tape, XH5-1A2 for NTSC, and XH5-1AP2 for PAL.

(3) DV EQ ADJ

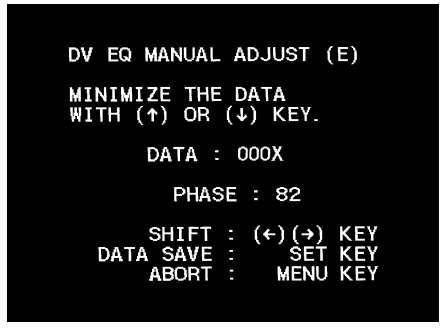
Move the cursor to “DV EQ ADJ” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

1. Press the [OUT] (→) key to enter the adjustment mode.

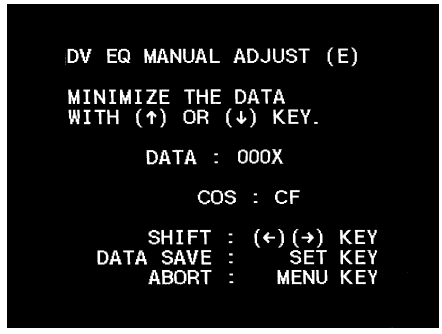


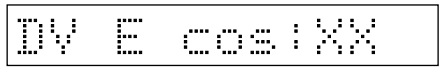


2. Playback the alignment tape XH4-1A/XH4-1AP. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select PHASE with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

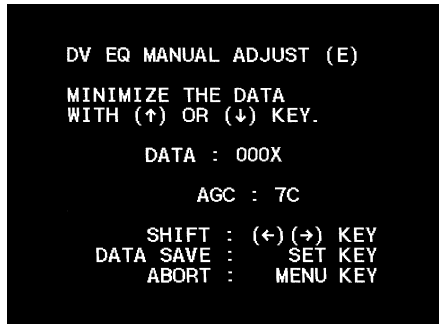


3. Playback the alignment tape XH4-1A/XH4-1AP. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select COS with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

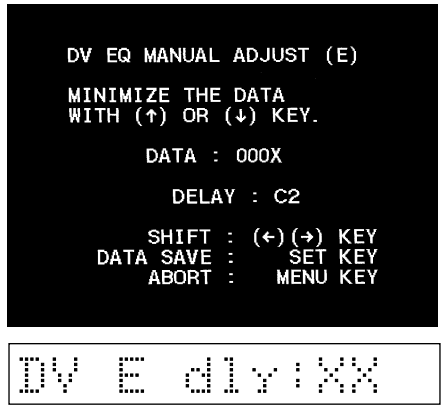




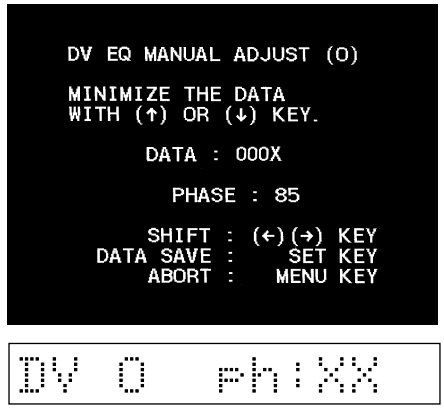
4. Playback the alignment tape XH4-1A/XH4-1AP. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select AGC with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



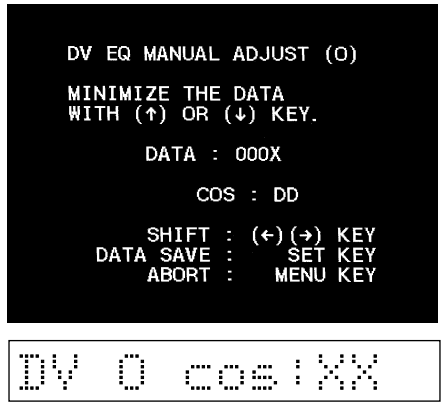
5. Playback the alignment tape XH4-1A/XH4-1AP. Select “E” in the parentheses ( ) in the top right with the [OUT] (→) key and select DELAY with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



6. Playback the alignment tape XH4-1A/XH4-1AP. Select “O” in the parentheses ( ) in the top right with the [OUT] (→) key and select PHASE with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



7. Playback the alignment tape XH4-1A/XH4-1AP. Select “O” in the parentheses ( ) in the top right with the [OUT] (→) key and select COS with the [OUT] (→) key at the same time. Perform adjustment until the data becomes nearly the minimum value (000X) using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

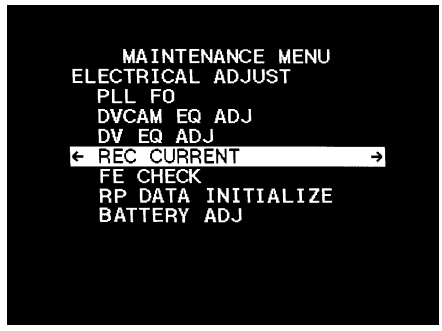


8. When the adjustment of the above described items are complete, press the [SET] key to save the adjustment data.

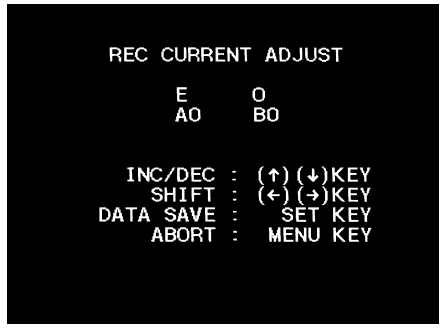
Note : The alignment tape, XH4-1A for NTSC, and XH4-1AP for PAL.

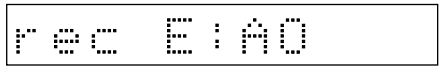
(4) REC CURRENT

Move the cursor to “REC CURRENT” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

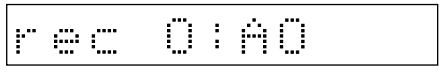


1. Press the [OUT] (→) key to enter the adjustment mode.
2. Press the [ENTRY] (↑), [AUTO EDIT] (↓) keys and the [IN] (←), [OUT] (→) keys to adjust the data to “A0”.





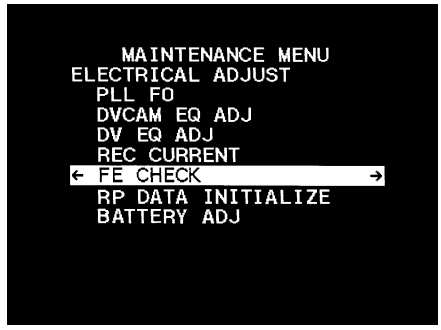
or

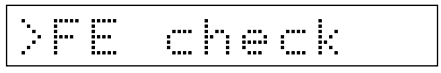


3. Press the [SET] key to save the data.

(5) FE CHECK

Move the cursor to “FE CHECK” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

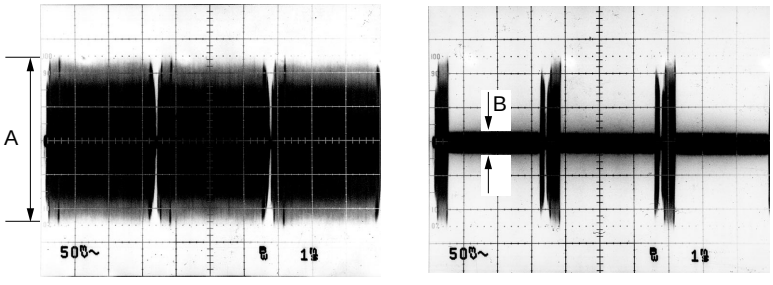




1. Insert a blank tape.
   (Operation is facilitated by setting the tape counter to 00, by pressing the following keys in this order : [HOLD], [RESET] and [SET] keys.)
2. Connect an oscilloscope as follows :
   Check : TP304/RP-105 board
   GND : E301
   TRIG : TP303
3. Press the [OUT] (→) key to enter the adjustment mode.

4. Select REC using the [ENTRY] (↑) key. Press the [PLAY] and [REC] keys.
   After recording for 30 to 60 seconds (tape counter reading), press the [STOP] key.
5. Playback the recorded segment and note down the waveform level.

6. Select FE ONLY using the [ENTRY] (↑) key. Press the [VIDEO] key to select VIDEO INS. Locate the tape segment that is recorded by step “4”, and press the [PLAY] and [EDIT] keys to record (i.e., erase) the recorded segment for about 30 seconds.
7. Playback the segment recorded (erased) in step 6. and confirm that the waveform level is 30% or less.



$B \leqq A \times 0.3$

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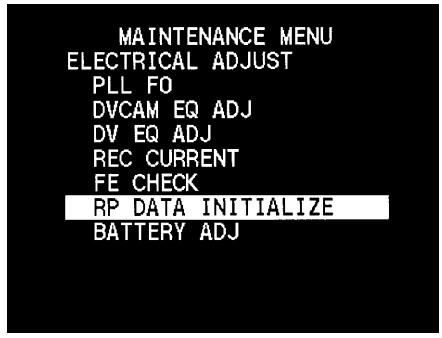
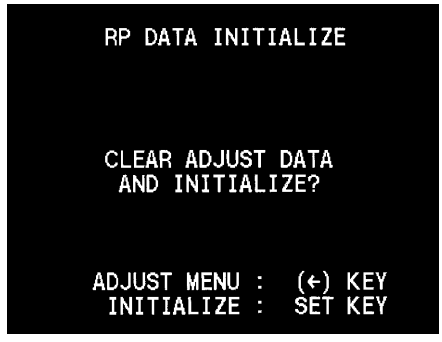
(6) RP DATA INITIALIZE

Move the cursor to “RP DATA INITIALIZE” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



Press the [SET] key to execute the RP DATA initialization.

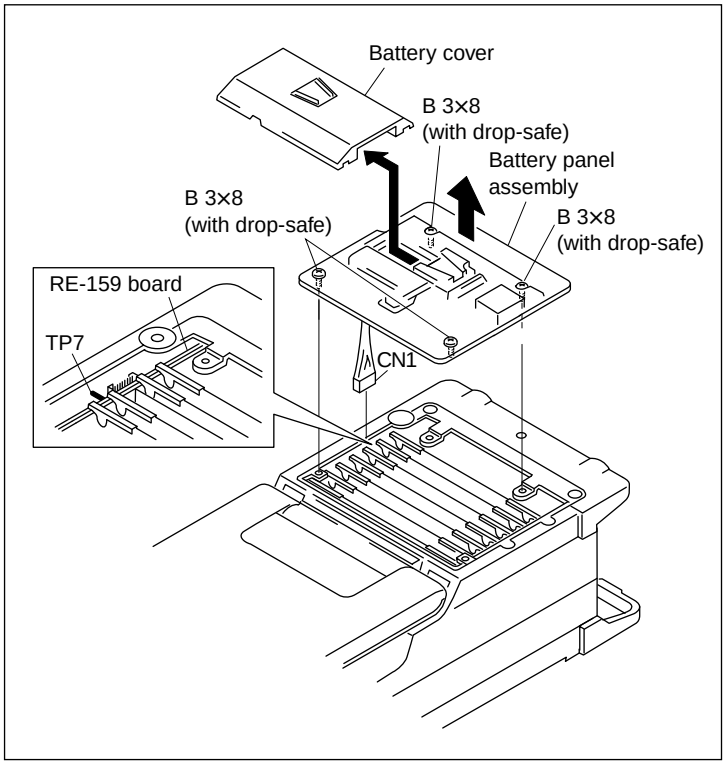


(7) BATTERY ADJ

Presets the reference voltages for the battery-before-end/battery-end voltage detector circuit.

Preparation

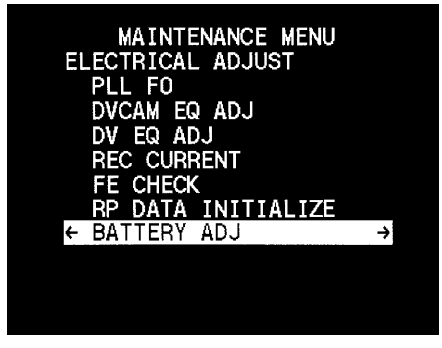
1. Set the POWER switch of the DSR-70/70P to ON five minutes before starting the adjustment.
2. Remove the battery panel assembly.
3. Connect a digital voltmeter to TP7 on the RE-159 board. Be careful that the probe does not contact the chassis of the DSR-70/70P.

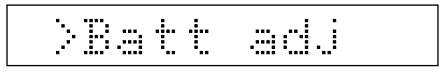


4. Connect an external DC power supply to the DC IN connector.

Operating procedure

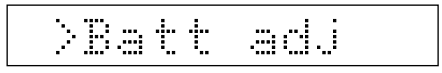
Move the cursor to “BATTERY ADJ” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.





1. Enter the adjustment mode using the [OUT] (→) key.
2. Adjust an external DC power supply until the digital voltmeter reading shows 10.81 ± 0.01 (V).
3. Press the [SET] key.

4. Re-adjust an external DC power supply until the digital voltmeter reading shows 12.84 ±0.01 (V).
5. Press the [SET] key to return to "ELECTRICAL ADJUST".



Note : If having entered this menu by mistake, be sure to exit this menu by pressing the [MENU] key. Never press the [SET] key. Otherwise, the wrong data will be stored.

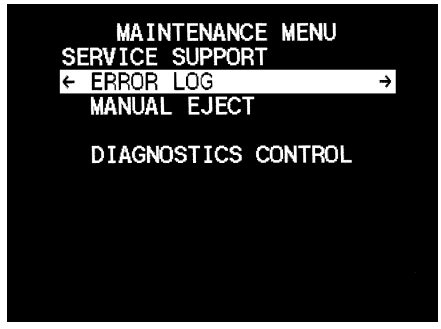
4-3-6. Service Support

Displays the error codes and error contents which occurred in the past.

Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to “SERVICE SUPPORT” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

3. Press the [OUT] (→) key.
   “SERVICE SUPPORT” is selected and its lower layer submenu appears.



4. Move the cursor displayed with a white background to a desired item using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
5. Press the [OUT] (→) key.
   The lower layer submenu appears.
6. Move the cursor displayed with a white background to a desired item using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
7. Press the [OUT] (→) key to execute the selected item.
   (Refer to the respective menu description for the check procedure after execution.)
8. After completing the check, press the [MENU] key to return to the main menu.
9. To check other menus and submenus, repeat steps 4 to 8.
10. Press the [MENU] key to exit the maintenance menu.

(1) ERROR LOG

The errors which occurred in the past are displayed.
(A maximum of the most recent eight errors are displayed.)

* The most recent error is displayed on the top.

Note : The servo system errors only are stored here. The ERROR-91, 92, 93, 94 and 95 are not stored.

(2) MANUAL EJECT

For the operating procedure of how to take out a tape when the EJECT is inoperable, refer to section 2-11.

(3) DIAGNOSTICS CONTROL

① CLEAR ERROR LOG

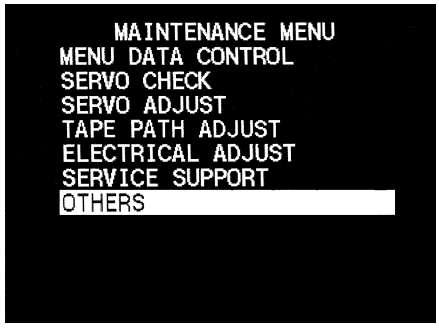
Clears the error history from the ERROR LOG.

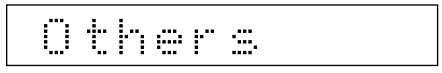
4-3-7. Others

Enables to check the software version, keyboard and others.

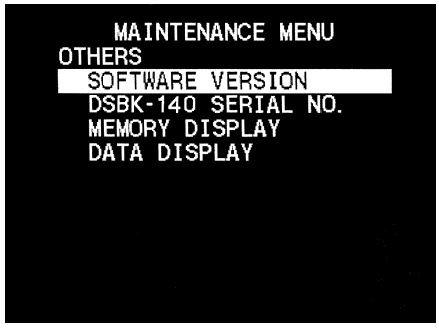
Operating procedure

1. Enter the maintenance menu.
2. Move the cursor to “OTHERS” which is displayed with a white background using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.





3. Press the [OUT] (→) key.
   “OTHERS” is selected and its lower layer submenu appears.



4. Move the cursor displayed with a white background to a desired item using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
5. Press the [OUT] (→) key to execute the selected item. (Refer to the respective menu description for the check procedure after execution.)
6. After completing the check, press the [IN] (←) key to return to the main menu.
7. To check other menus and submenus, repeat steps 4 to 6.
8. Press the [MENU] key to exit the maintenance menu.

(1) SOFTWARE VERSION

Displays the model information and software version numbers.

SY : Version of IC102 on the SY-269 board.
SP : Version of IC302 on the SY-269 board.
SV : Version of IC11 on the SV-203 board.
DR : Version of IC1 on the DR-364 board.
KY : Version of IC204 on the KY-433 board.
DP : Version of IC101 on the DP-281 board.
TBC : Version of IC205 on the DEN-12 board.
DIF : Version of IC401 on the SDI-38 board.
(When DSBK-160 is installed.)
Version of IC604 on the SDI-39 board.
(When DSBK-150 is installed.)
DV : Version of IC401 on the DV-19 board.
(When DSBK-140 is installed.)
PP : Version of IC301 on the PP-55 board.
(When DSBK-180/180P is installed.)
MENU : Version of the setup menu.

* The message NONE appears for the DIF, DV and PP when the optional board is not installed in the DSR-70/70P.
* Contents which are shown in the time counter display can be changed using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
* Press the [IN] (←) key or the [MENU] key to return to the maintenance menu.

(2) DSBK-140 SERIAL NO.

When replacing the IC404 in DSBK-140, set the serial number of DSBK-140.

(3) MEMORY DISPLAY

* Factory use only.

(4) DATA DISPLAY

* Factory use only.

SECTION 5
PERIODIC INSPECTION AND MAINTENANCE

5-1. PERIODIC INSPECTION LIST

The following table shows the reference parts replacement time which is not the warranty time of parts.
Refer to the following table to establish the periodic inspection schedule which realizes the full performance and function of a unit and to extend life of a tape. The actual parts replacement period depend on the operating environment and conditions of a unit.

☆ : Part replace ◇ : Check (Adjustment) ○ : Cleaning

Inspection items			Hours meter	Inspection time (Hours)			
Item	**Part No.**	**Name**	**Menu No.**	**1500**	**3000**	**4500**	**6000**
Drum assembly	A-8320-778-A	DEH-13A-R	H02	☆	☆	☆	☆
Tape drive system blocks							
Pinch solenoid	A-8279-041-	Pinch Solenoid assembly	H02	–	–	–	◇
Main brake solenoid	1-454-871-11	Solenoid plunger	H02	–	–	–	◇
Reel motor (T)	8-835-615-51	DC motor (SRD12A/J-RP)	H02	–	◇	–	◇
Reel motor (S)	8-835-616-51	DC motor (SRD13A/J-RP)	H02	–	◇	–	◇
Threading motor	A-8279-042-	Motor gear assembly	H02	–	◇	–	◇
Reel sift motor	A-8279-045-	RS motor assembly	H02	–	◇	–	◇
T reel brake shoe	A-8320-828-	Brake (T) assembly	H02	◇	◇	◇	◇
S reel brake shoe	A-8320-827-	Brake (S) assembly	H02	◇	◇	◇	◇
Tape path system blocks							
Capstan motor	8-835-619-51	DC motor (SCD16A/J-RP)	H02	–	◇	–	◇
Pinch roller	A-8279-044-	Pinch limiter assembly	H02	☆	☆	☆	☆
Guide roller T2	A-8279-024-	Shuttle (R) assembly	H02	◇	◇	◇	◇
Guide roller T3	A-8279-028-	TG-8 arm assembly	H02	◇	◇	◇	◇
Guide roller T4	A-8279-026-	T drawer arm assembly	H02	◇	◇	◇	◇
Guide roller S2	A-8279-023-	Shuttle (L) assembly	H02	◇	◇	◇	◇
Guide roller S3	A-8320-109-	Tension regulator assembly	H02	◇	◇	◇	◇
Guide roller S4	A-8279-027-	TG-1 arm assembly	H02	◇	◇	◇	◇
Tape running surface (including tape cleaner)	——	——	——	○	○	○	○
Others							
Cassette memory terminal	A-8320-102-	MIC assembly	H02	◇○	◇○	◇○	◇○

H01: OPERATION HOURS H02 : DRUM RUNNING HOURS H03 : TAPE RUNNING HOURS

5-2. HOURS METER

The hours meter data is displayed on the LCD display. Periodic inspection and part replacement are recommended to be performed using the hours meter reading.

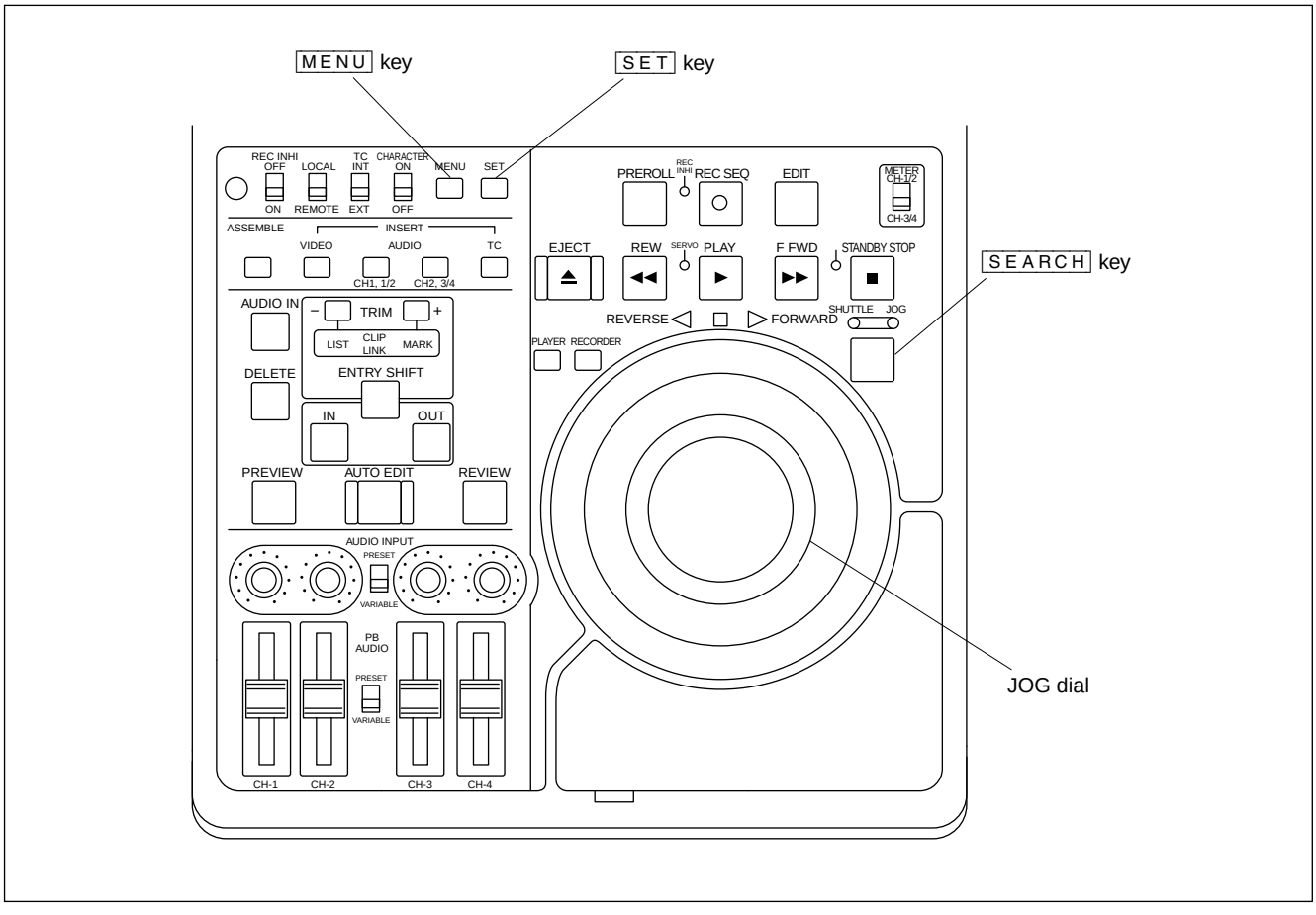
1. Hours Meter Display Contents

Menu number	Item	Contents
H01	OPERATION HOURS	Accumulated hours of power on
H02	DRUM RUNNING HOURS	Accumulated hours of drum rotation
H03	TAPE RUNNING HOURS	Accumulated hours of tape running
H04	THREADING COUNTER	Number of times of threading
H12	DRUM RUNNING HOURS	Accumulated hours of drum rotation (reset enabled)
H13	TAPE RUNNING HOURS	Accumulated hours of power on (reset enabled)
H14	THREADING COUNTER	Number of times of threading (reset enabled)

2. How to Display Hours Meter Information

(1) Press the MENU key on the control panel.
The menu list and contents as shown above appear.

(2) Press the MENU key again to exit the menu display.



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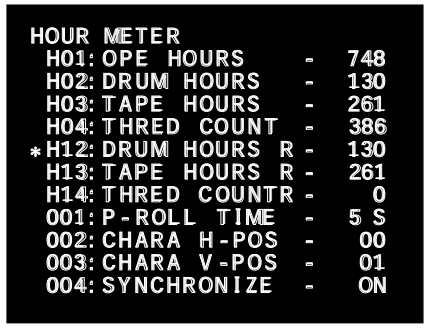
3. How to Reset Hours Meter

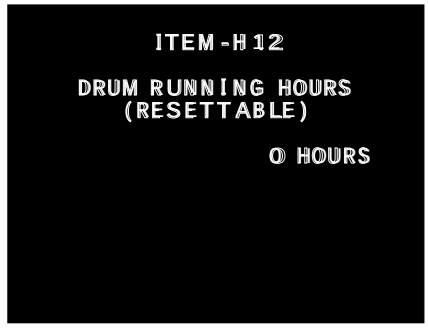
The menus H12, H13 and H14 can be reset by the following procedure.

(1) Set the switch S101-1 on the SV-203 board to ON (up).
(2) Press the [MENU] key on the control panel. The menu list appears.


HOUR METER
H01:OPE HOURS - 748
H02:DRUM HOURS - 130
H03:TAPE HOURS - 261
H04:THRED COUNT - 386
*H12:DRUM HOURS R - 130
H13:TAPE HOURS R - 261
H14:THRED COUNTR - 0
001:P-ROLL TIME - 5 S
002:CHARA H-POS - 00
003:CHARA V-POS - 01
004:SYNCHRONIZE - ON

(3) Turn the JOG dial to move the asterisk (*) mark and select either H12 or H13 or H14. (Example to select H12 is shown.)

(4) While pressing the [SEARCH] key, turn the JOG dial to set "0 HOURS".



(5) Press the [SET] key on the control panel to save the reset data.

(6) Set the switch S101-1 on the SV-203 board to OFF (down).

5-3. MAINTENANCE UPON COMPLETION OF REPAIR

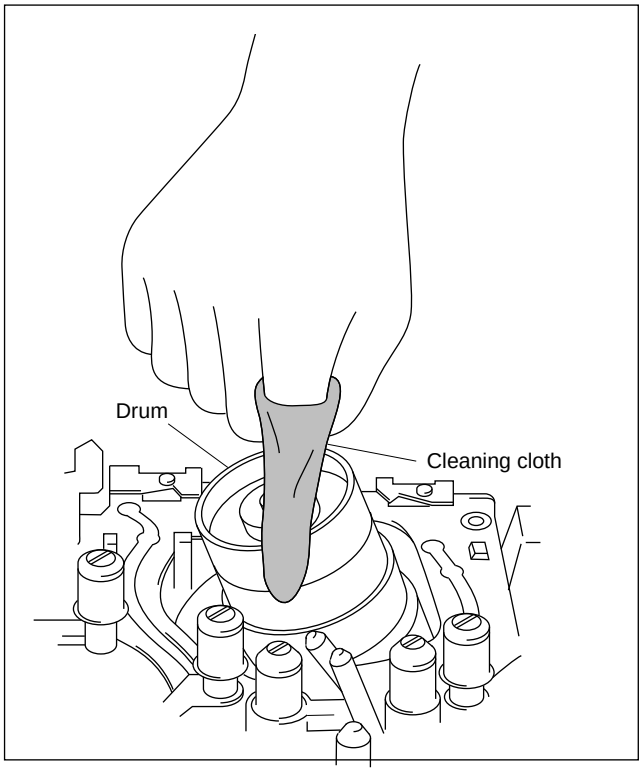
Whenever repairing a unit is completed, perform the following maintenance work regardless of the elapsed operating hours of the unit.

- Video head cleaning
- Tape running path cleaning

Note :
- **Before starting cleaning, remove the cassette compartment.**
- **After a unit is cleaned, insert a cassette after cleaning fluid is dried completely.**

5-3-1. Video Head Cleaning Procedure

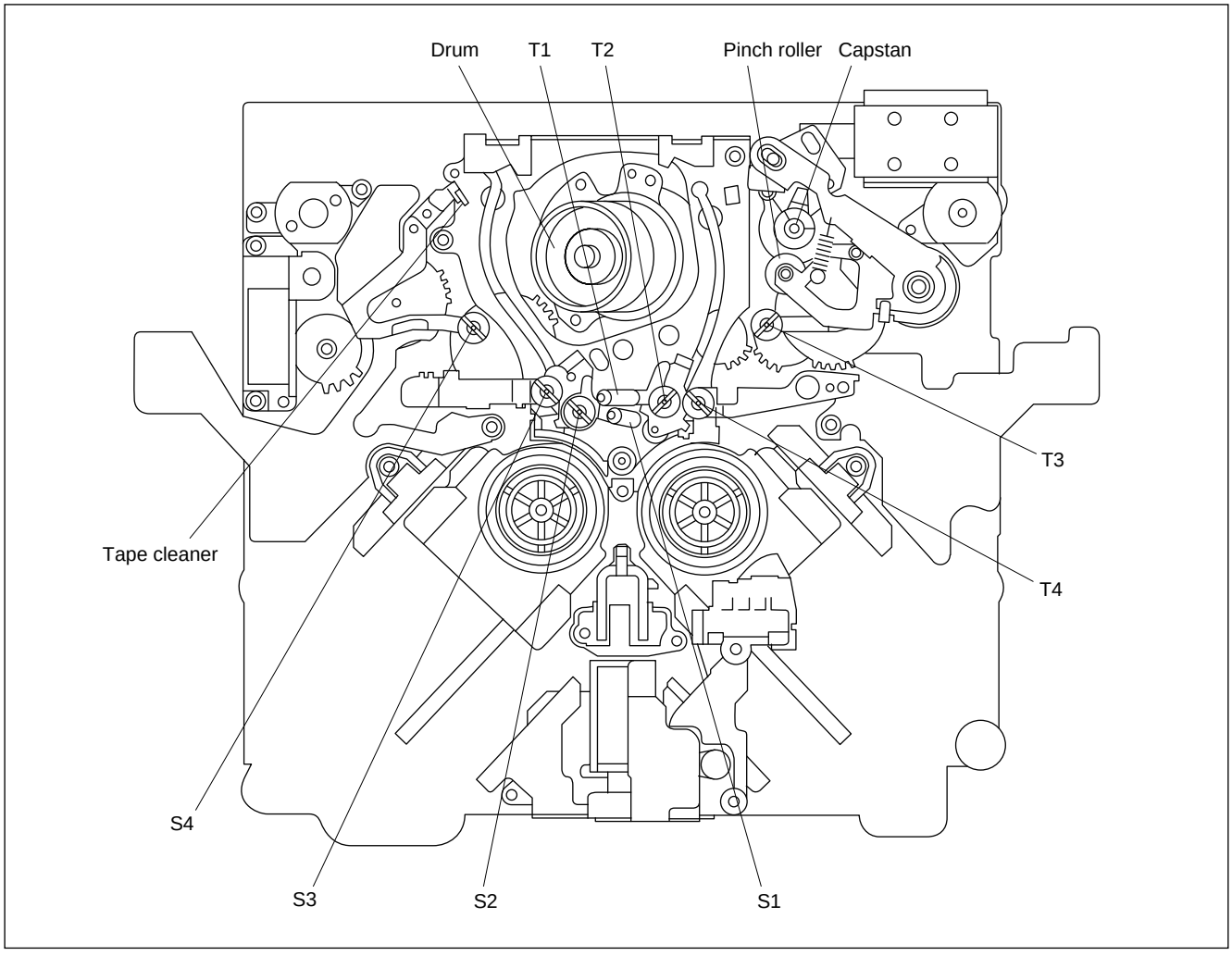
- Bring a cleaning cloth moistened with cleaning fluid in contact with the head tip gently, and rotate the drum slowly with hand for cleaning.
- After cleaning, wipe off moisture by rotating the drum slowly several times using a dry cleaning cloth.



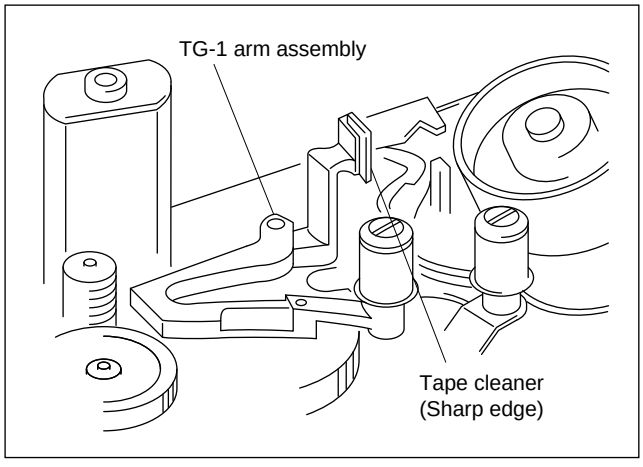
Note : Never rotate the drum assembly by turning on the main power.
Never move the cleaning cloth wrapping around your finger in the clockwise direction.
Never move the cleaning cloth in the vertical direction with respect to the drum rotating direction. Moving the cleaning cloth vertically damages rotating heads, Never clean them vertically.

5-3-2. Tape Running Path Cleaning

Clean the tape guide, drum, capstan, pinch roller, tape cleaner and other parts which contact with video tape, with cleaning cloth moistened with cleaning fluid.



Note : Be careful of the tape cleaner during cleaning because it has sharp edge.



SECTION 6
REPLACEMENT OF MECHANICAL PARTS

6-1. GENERAL INFORMATION ON PARTS REPLACEMENT AND ADJUSTMENT

6-1-1. Preparation Before Starting Parts Replacement

- Remove the ornamental parts as needed.
- When replacing parts or performing mechanical adjustment, remove the cassette compartment from the DSR-70/70P unless otherwise specified. (Refer to section 2-7-4.)
- When the connector of the cassette compartment is removed, the protection circuit starts functioning.
  Refer to section "2-13. OPERATING THE VCR WITHOUT A CASSETTE TAPE." to operate the DSR-70/70P without inserting a cassette tape.
- Remove the mechanism deck from the DSR-70/70P as needed. (Refer to section 2-7-5.)

6-1-2. Drum Assembly

- The drum assembly is a periodic replacement part. The drum should be replaced in accordance with the periodic replacement list.
- The drum assembly must be replaced in the following cases:
  (1) When the heads wear out such that the proper tape-to-head contact is lost and recording and playback cannot be performed correctly;
  (2) The rabbet guide of the lower drum wears out such that the correct RF envelope cannot be obtained even after adjusting the tape path to optimize the tracking.
  (3) When the rabbet guide or tape running surface of the lower drum is damaged;
  (4) If the drum rotation is abnormal and the VTR does not work properly due to noise or jitter.

6-1-3. Grease

Be sure to use only the specified grease.
If grease other than the specified one is used, major malfunctions may result due to differences in grease viscosity and its constituents.
If grease containing dirt is used, the shafts and bearings may be damaged and major malfunctions may result.

Use the following grease for the DSR-70/70P:

Grease (SGL-505 (20 g)) : 7-662-010-04

- Do not coat any parts with grease other than the specified one.
- Coat just enough grease to leave a thin film on the surface.
  Wipe off any grease that oozes out into the surrounding parts with gauze or a soft cloth.

6-1-4. Tightening Torque and Handling of Washers

1. Screwdrivers and Tightening Torque of Screws

Many M1.4 and M2 screws are used in the DSR-70/70P.
Be sure to use the specified tools to loosen and tighten them.
In addition, use a torque screwdriver to tighten the screws with the specified tightening torque.

Torque screwdriver Bit (For M 1.4) : J-6325-110-A
Torque screwdriver Bit (For M 2) : J-6325-380-A
Hexagon bit (For torque screwdriver) : J-6326-120-A
Torque screwdriver (For 3 kg/cm) : J-6325-400-A

Tightening torque
For M1.4 screw : 9×10^{-2} N•m (0.9 kgf•cm)
For M2 screw : 20×10^{-2} N•m (2.0 kgf•cm)

Reference : The DSR-70/70P uses many small screws that are easily dropped into the machine when removing and re-assembling parts. To avoid this risk, magnetize the screwdriver bit slightly to stop small screws from falling into the machine.

2. Stop Washer and E-ring

Do not use old stop washers and E-rings that have been removed.
Always use new stop washers and E-ring to attach the parts.

Stop washer (1.5) : 3-669-465-01
Stop washer (2.3) : 3-669-596-01
E-ring (2.3) : 7-624-105-04
Poly-washer : 3-321-813-01

How to Remove the Stop Washers and E-ring

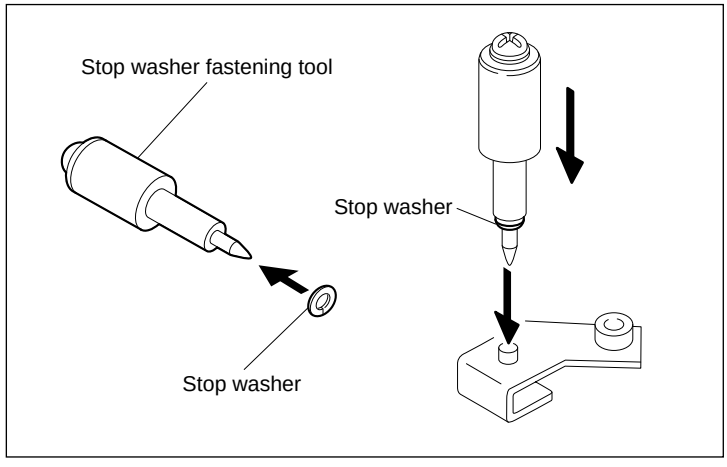
(a) Remove the stop washers and E-ring with small needle nose pliers or tweezers.

Note : • Be careful not to drop the stop washers and E-ring inside the DSR-70/70P.
• Be careful not to let tools touch other parts, especially the drum.

How to Attach the Stop Washers

Use the following tools to attach stop washers:
Stop washer fastening tool : J-6323-530-A

(a) Insert a stop washer to the tip of the stop washer fastening tool.
(b) Hold the thin tip of the tool perpendicular to the top of the shaft to which the stop washer is to be installed.
(c) Press the thick portion of the tool downward to install the stop washer onto the shaft.



6-2. DRUM ASSEMBLY REPLACEMENT

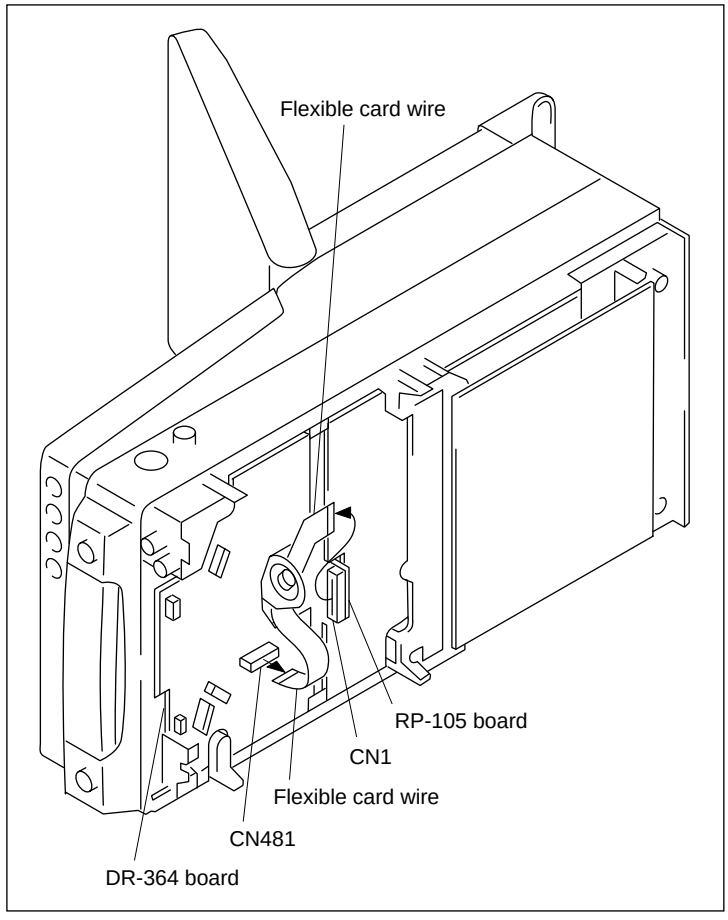
Note : Be careful not to damage the tape guides in the vicinity of the drum assembly, nor the tape running surface of the drum assembly.

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

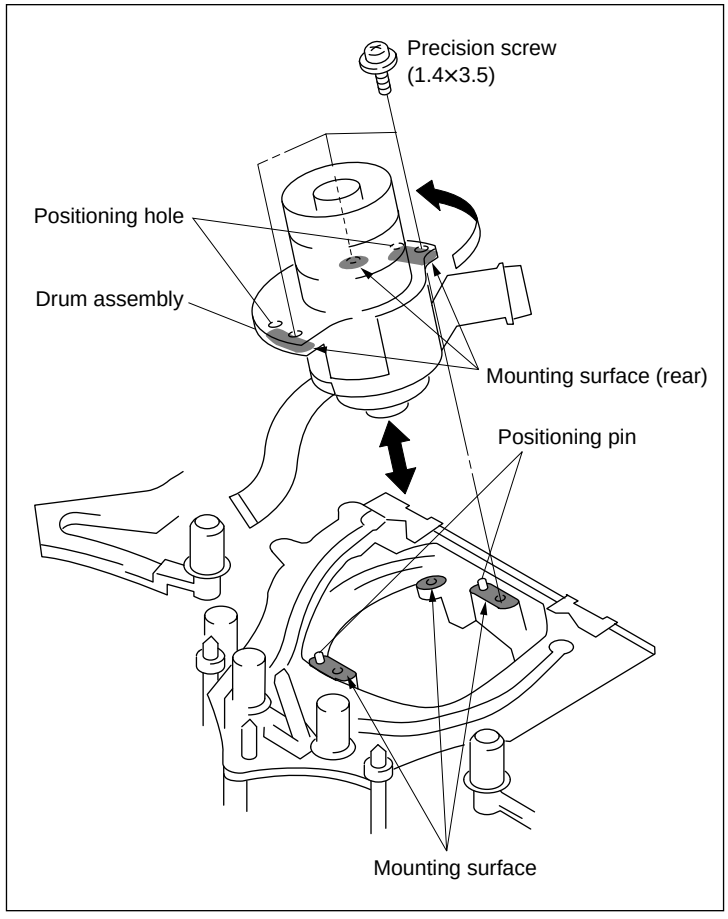
1. Place the DSR-70/70P with its left side down.
2. Remove the bottom plate assembly.
   (Refer to section 2-6-3.)
3. Remove the flexible card wire from the connector (CN481) on the DR-364 board.
4. Remove the flexible card wire from the connector (CN1) on the RP-105 board.



5. Place the DSR-70/70P horizontally.
6. Remove the three precision screws securing the drum assembly from the mechanism assembly and remove the drum assembly while taking care not to let it touch the various guides.

Attachment

7. Clean the mounting surface of the new drum and the mounting surface of the MD chassis using the cleaning cloth moistened with cleaning fluid.
8. Align the two positioning pins of the MD chassis with the positioning holes in the bottom of the drum assembly, then insert the drum assembly into the MD chassis.
9. While pushing the drum assembly in the direction of the arrow (turning counter clockwise), fix the drum assembly with the three screws.
10. Connect the connectors and attach the disassembled parts by reversing the removal procedure from step 4 to 1.
11. Clean the tape running surface of the drum assembly using the cleaning cloth moistened with cleaning fluid.
12. After cleaning, wipe the cleaned surface two or three times with a dry cloth.



Adjustment After Replacement

- Perform the tape path adjustment. (Refer to section 7.)
- Perform the RF switching position adjustment. (Refer to section 7-3.)
- Perform the EQ adjustment. (Refer to section 4.)

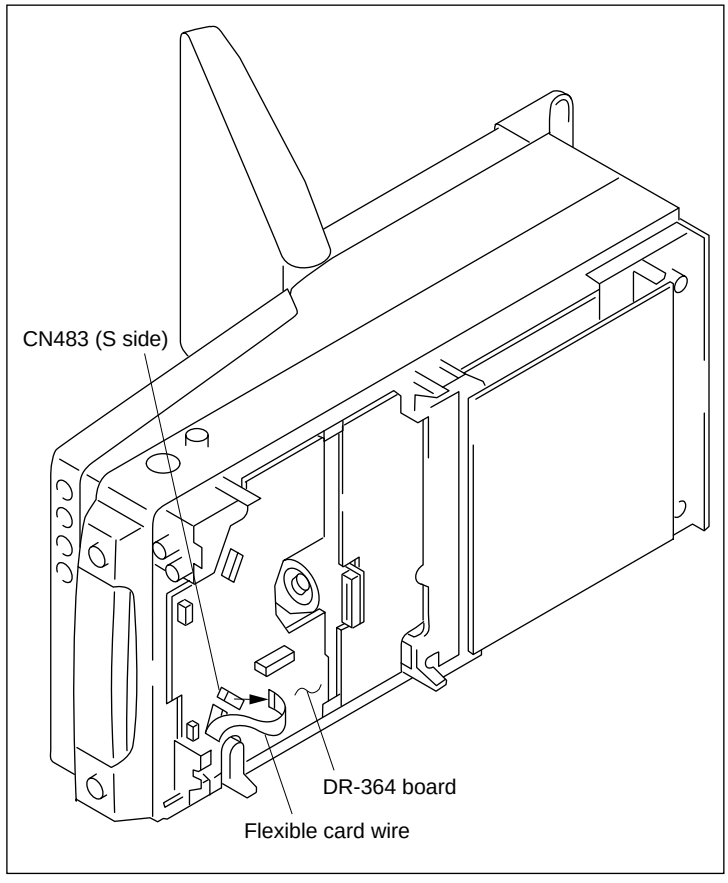
6-3. DC MOTOR SRD13A/J-RP (REEL MOTOR S) REPLACEMENT

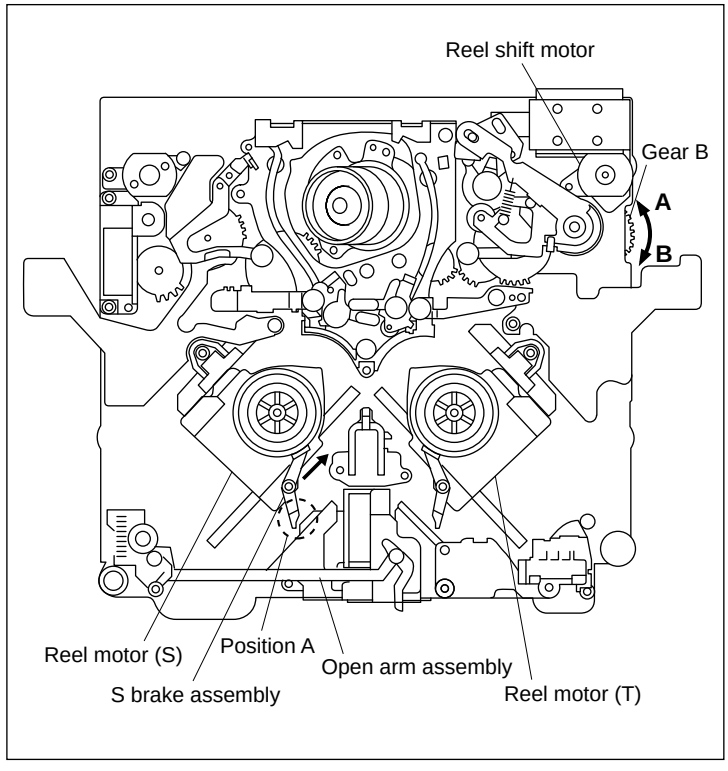
Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Grease (SGL-505) : 7-662-010-04
Three bond-1401B : 7-432-114-11

Removal

1. Place the DSR-70/70P with its left side down, and remove the bottom plate. (Refer to section 2-6-3.)
2. Remove the flexible card wire from the connector (CN483) on the DR-364 board.
3. Place the DSR-70/70P horizontally.
4. Revolve gear B of the reel shift motor in direction **A** with your fingers until the reel motor (S) has moved to the standard cassette position.
5. Revolve gear B in direction **B** until the S brake assembly of the reel motor (S) has moved to position A.





6. Move the RLR claw assembly in the direction of the arrow from the MD chassis and remove the two screws.

   Note : Be careful not to scratch the slide shaft when removing and inserting the slide shaft.

7. Remove the Reel motor (S) together with the slide shaft from the RMP holder assembly while removing the protrusion of the reel motor (S).
8. Remove the slide shaft from the reel motor (S) by pushing the slide shaft in the direction of the arrow as shown.

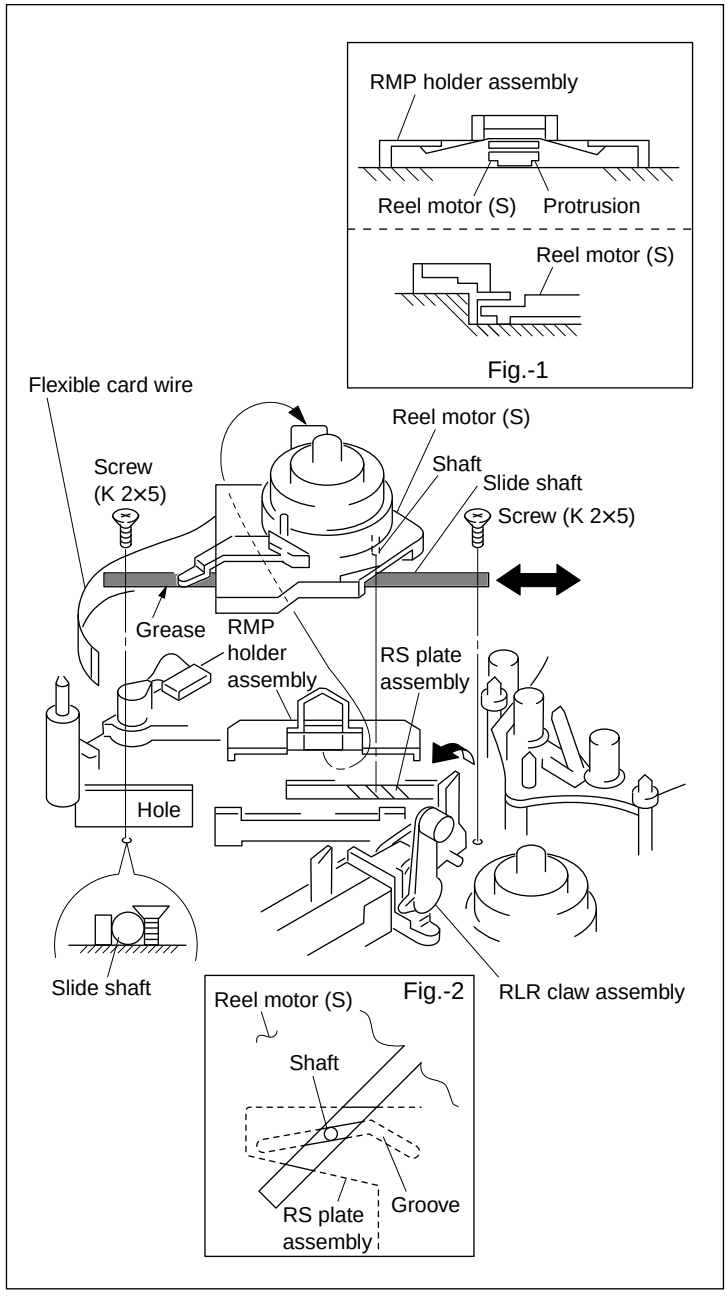
Attachment

9. Clean the hole through which the slide shaft passes, and clean the protrusion of the new reel motor (S) using the cleaning cloth moistened with cleaning fluid.
10. Clean the slide shaft using the cleaning cloth moistened with cleaning fluid.
11. Coat the ▬ area of the slide shaft with grease.
12. Insert the slide shaft into the hole of the reel motor (S).
13. Insert the protrusion of the reel motor (S) in which the slide shaft has already been inserted, into the RMP holder assembly (Fig.-1), and insert the shaft into the groove of the RS plate assembly (Fig.-2). Then, attach the slide shaft with two screws (after coating the screw thread with screw locking compound).

    Tightening torque :

    9×10^{-2} N•m (0.9 kgf•cm)

14. Confirm that the reel motor (S) moves smoothly by revolving the gear B with your fingers.
15. Route the flexible card wire through the hole of the MD chassis and connect the flexible card wire to the connector (CN483) of the DR-364 board.



Adjustment After Replacement

- Perform the reel duty adjustment. (Refer to section 4.)
- Perform the offset friction adjustment. (Refer to section 4.)
- Perform the reel torque adjustment. (Refer to section 4.)
- Perform the tape tension adjustment. (Refer to section 4.)
- Perform the tape path check. (Refer to section 7.)

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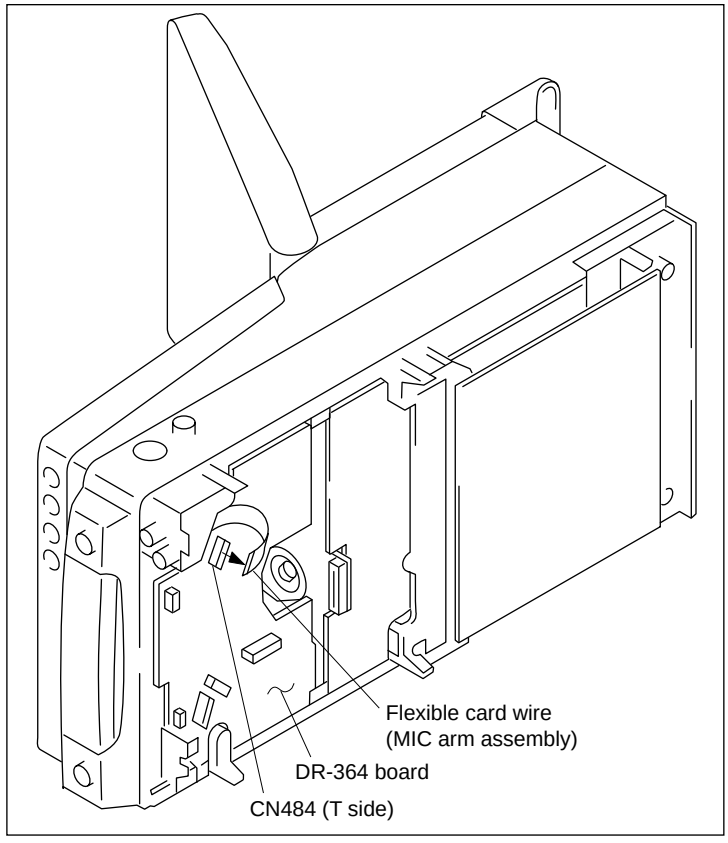
6-4. DC MOTOR SRD12A/J-RP (REEL MOTOR T) REPLACEMENT

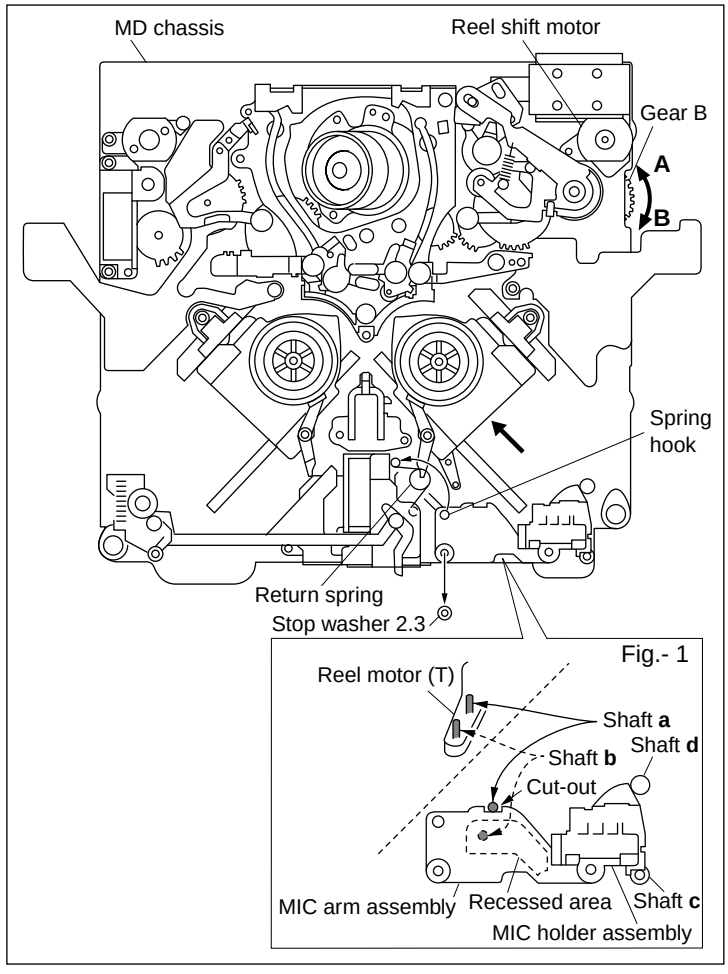
Tools

Cleaning cloth	: 3-184-527-01
Cleaning fluid	: 9-919-573-01
Grease (SGL-505)	: 7-662-010-04
Stop washer fastening tool	: J-6323-530-A
Three bond-1401B	: 7-432-114-11

Removal

1. Remove the bottom plate assembly. (Refer to section 2-6-3.)
2. Remove the flexible card wire from the connector (CN484) on the DR-364 board.
3. Place the DSR-70/70P with its left side down.
4. Revolve gear B in direction **A** to move the reel motor (T) to the standard cassette position.
5. Remove the return spring of the MIC arm assembly from the spring hook.
6. Remove the stop washer 1.5 from the MD chassis. While raising up the MIC arm assembly in direction **C**, revolve gear B slightly in direction **B** until the shaft "**b**" of the T reel table assembly can be removed.





7. Move the RLR claw assembly in the direction of the arrow from the MD chassis and remove the two screws.
   Note : Be careful not to scratch the slide shaft when removing and inserting the slide shaft.

8. Remove the reel motor (T) together with the slide shaft from the RMP holder assembly while removing the protrusion of the reel motor (T).
9. Remove the slide shaft from the reel motor (T) by pushing the slide shaft in the direction of the arrow.

Attachment

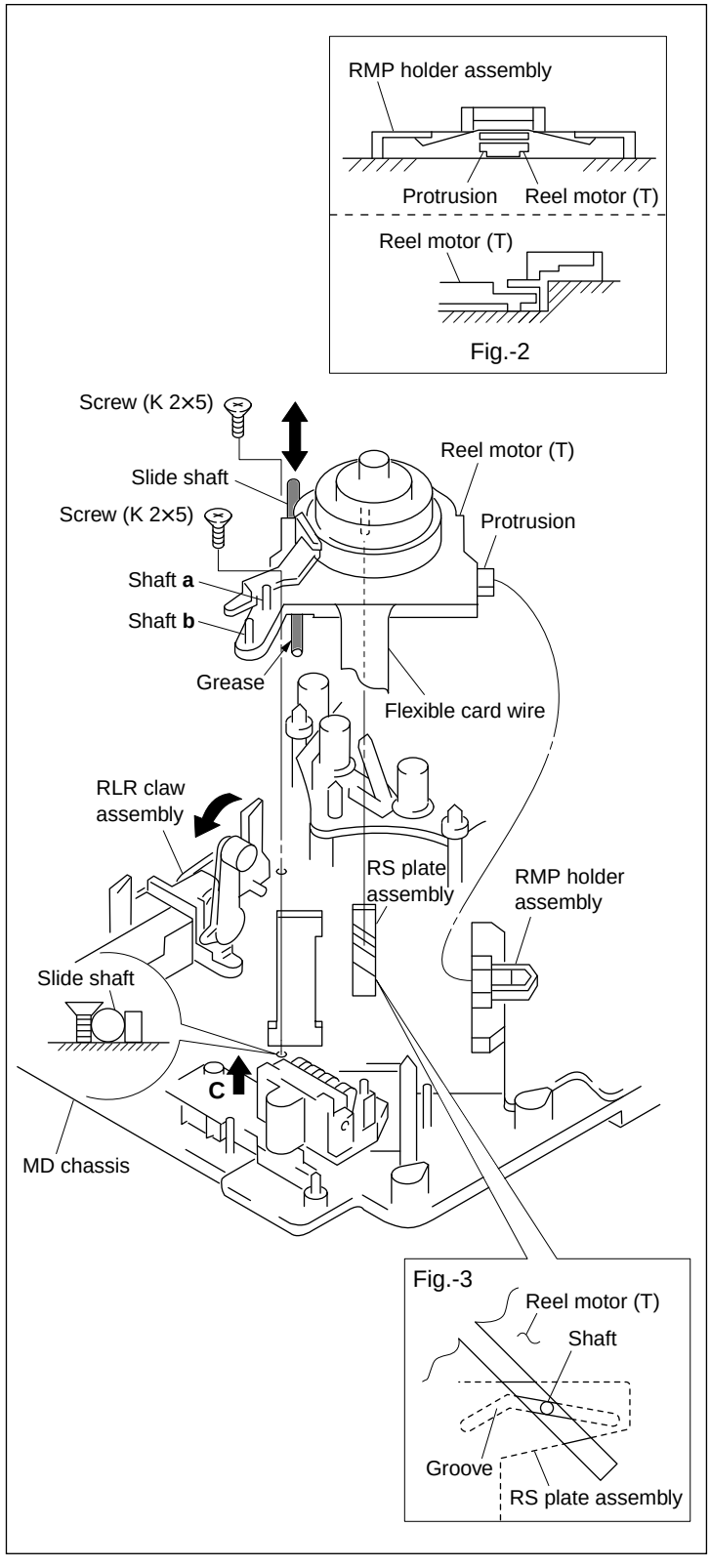
10. Clean the hole through which the slide shaft passes and clean the protrusion of the new reel motor (T) using the cleaning cloth moistened with cleaning fluid.
11. Clean the slide shaft with the cleaning cloth moistened with cleaning fluid.
12. Coat the ▬ area of the slide shaft with grease.
13. Insert the slide shaft into the hole of the reel motor (T).
14. Insert the protrusion of the reel motor (T) in which the slide shaft has already been inserted, to the RMP holder assembly (Fig.-2) and insert the shaft into the groove (Fig.-3) of the RS plate assembly. Fix the slide shaft with the two screws (after coating the screw thread with screw locking compound).

    Tightening torque:
    9×10^{-2} N•m (0.9 kgf•cm)

15. Revolve gear B with your fingers to return the reel motor (T) to the standard cassette position.
16. Attach the MIC arm assembly and the MIC holder assembly to the MD chassis with the stop washer 2.3 as shown in Fig.-1.
17. Hook the return spring of the MIC arm assembly onto the spring hook.
18. Reverse the removal procedure from step 2 to 1.

Adjustment After Replacement

- Perform the reel duty adjustment. (Refer to section 4.)
- Perform the offset friction adjustment. (Refer to section 4.)
- Perform the reel torque adjustment. (Refer to section 4.)
- Perform the tape tension adjustment. (Refer to section 4.)
- Perform the tape path check. (Refer to section 7.)



6-5. SUPPLY AND TAKEUP BRAKE ASSEMBLY REPLACEMENT

• The brake assembly replacement procedure is the same for both the supply side and the takeup side.

Removal

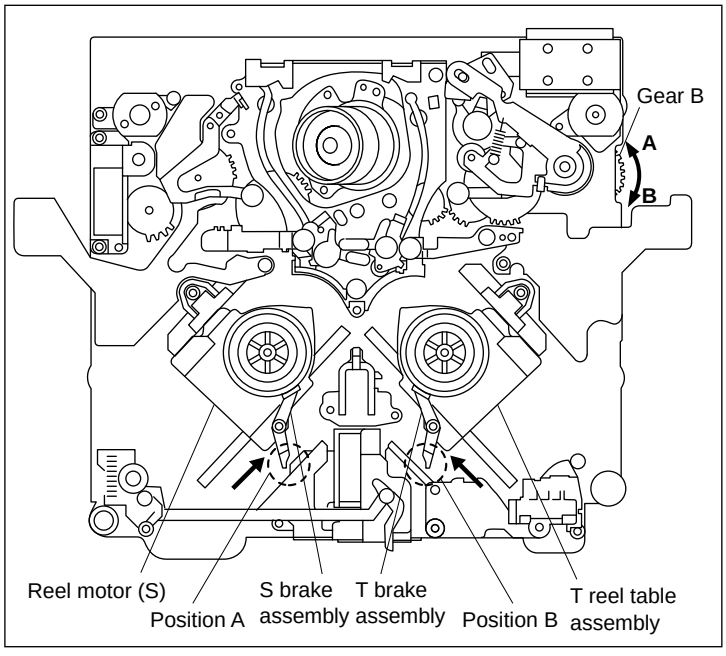
1. Revolve gear B of the reel shift motor in the direction of the arrow with your fingers to move the reel motor (S)/(T) to the standard cassette position.
2. Revolve gear B in direction **B** to move the brake assemblies of the reel motor (S)/(T) to positions A and B respectively.

Note : When removing the brake, be sure not to lose the return brake spring S/T.

3. Remove the poly-washer 1.5 from the reel motor (S)/(T), and remove the S or T brake assembly and the brake spring S/T.

Attachment

4. Hook the brake spring S/T on the new S or T brake assembly and onto the spring hook S/T. Fix the spring hook with the poly-washer. (Fig.-1)
5. Attach the removed parts by reversing the removal procedure from step 2 to 1.



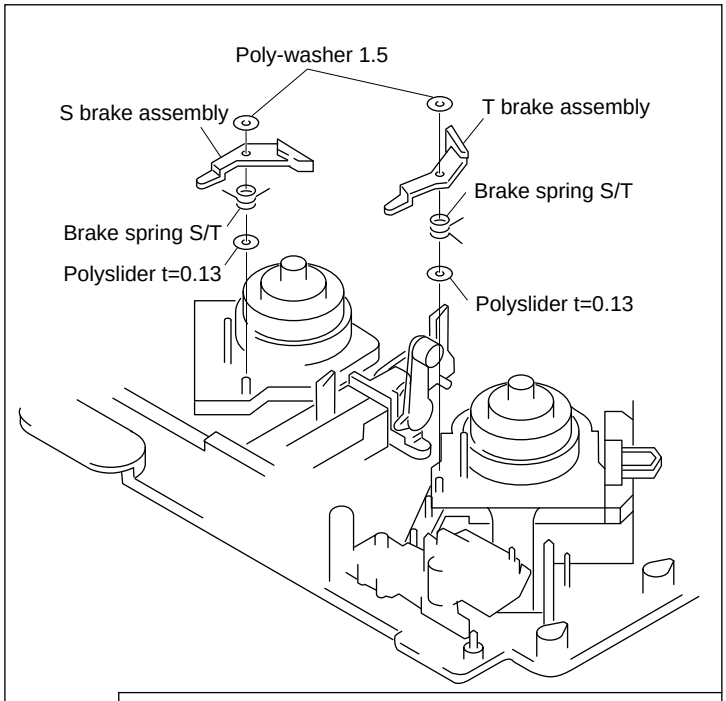
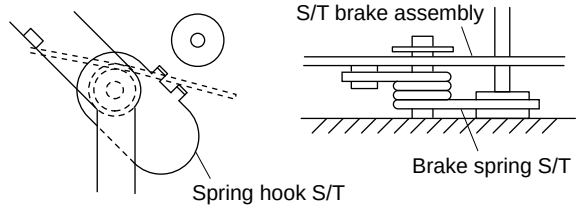


Fig.-1



6-6. BRAKE BASE ASSEMBLY REPLACEMENT

Tools

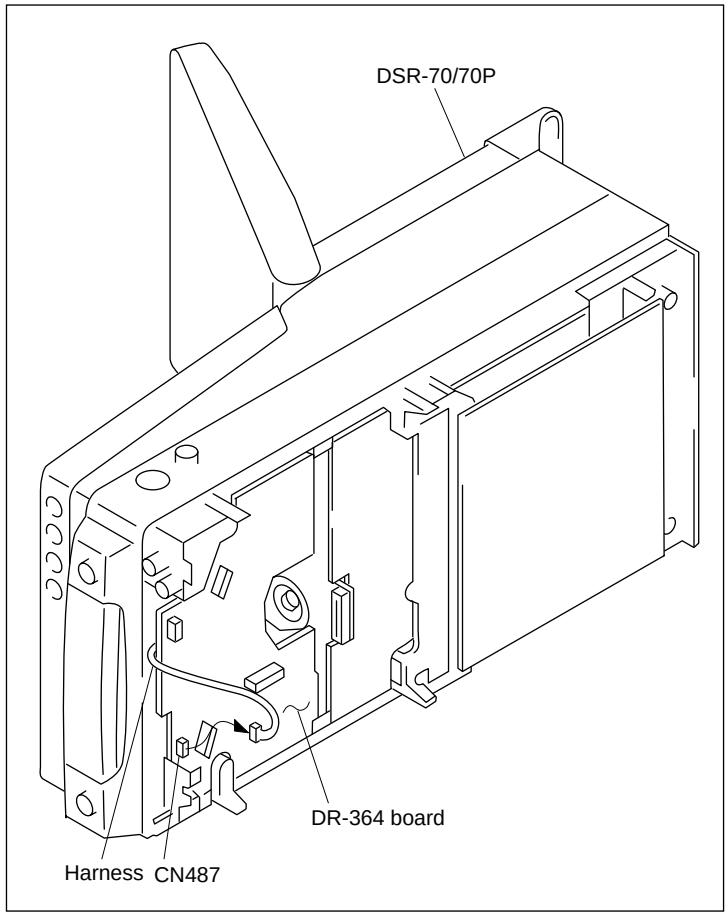
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Grease (SGL-505) : 7-662-010-04

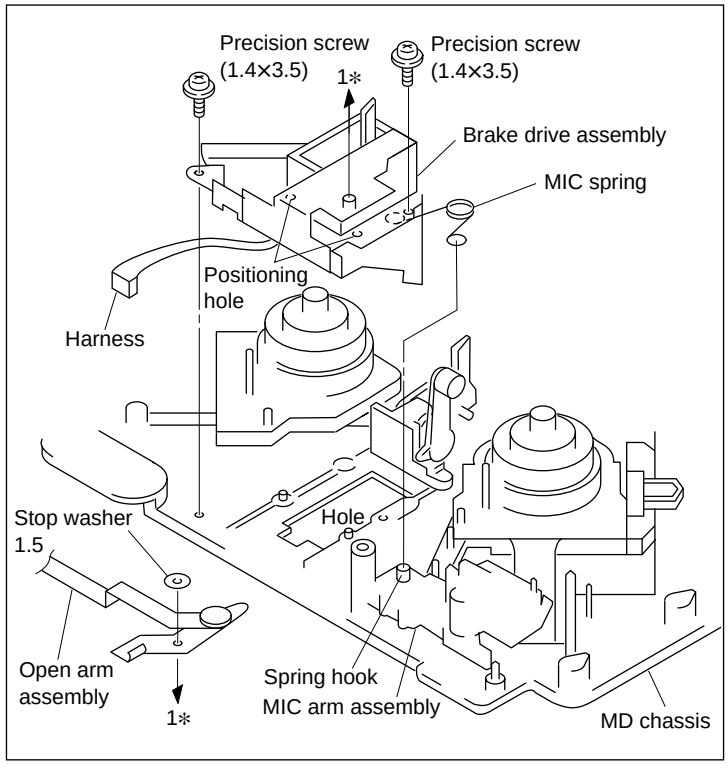
Removal

1. Place the DSR-70/70P with its left side down.
2. Remove the bottom plate assembly.
   (Refer to section 2-6-3.)
3. Remove the harness from the connector (CN487) of the DR-364 board.
4. Place the DSR-70/70P horizontally.
5. Remove the stop washer 1.5 from the brake drive assembly and remove the open arm assembly.
6. Remove the return spring of the MIC arm assembly from the spring hook.

Note : Be careful as the MIC spring can be easily removed.

7. Remove the two precision screws from the MD chassis and remove the brake drive assembly.





8. Remove the two screws from the brake solenoid, push the brake drive arm in the direction of **A**, then remove the brake solenoid, compression coil spring, and polyslider together with the iron core.
9. Remove the brake drive arm in the direction of **B**.

Attachment

10. While aligning the key slots of the brake drive arm with the three slide pins of the brake base assembly, attach the brake drive arm.
11. Attach the polyslider washer and compression coil T spring to the iron core of the brake solenoid.
12. Insert the pin of the iron core into the hole of the brake drive arm, and attach the brake solenoid to the new brake base assembly with the two screws.
13. Re-assemble the parts by reversing the removal procedure from step 5 to 1.
14. Clean the area marked by thick line (— - —) of the brake drive arm with the cleaning cloth moistened with cleaning fluid before applying grease. (Fig.-1)
15. Coat the three key slots and the area marked by the thick line (— - —) in Fig.-1 of the brake drive arm with grease.

Adjustment After Replacement

16. When the iron core is fully pressed in the direction of the arrow, the clearance between the brake drive arm and brake base assembly should satisfy the specification Ⓐ. If not, adjust the brake base assembly with the screw "**a**" until the specification is satisfied.

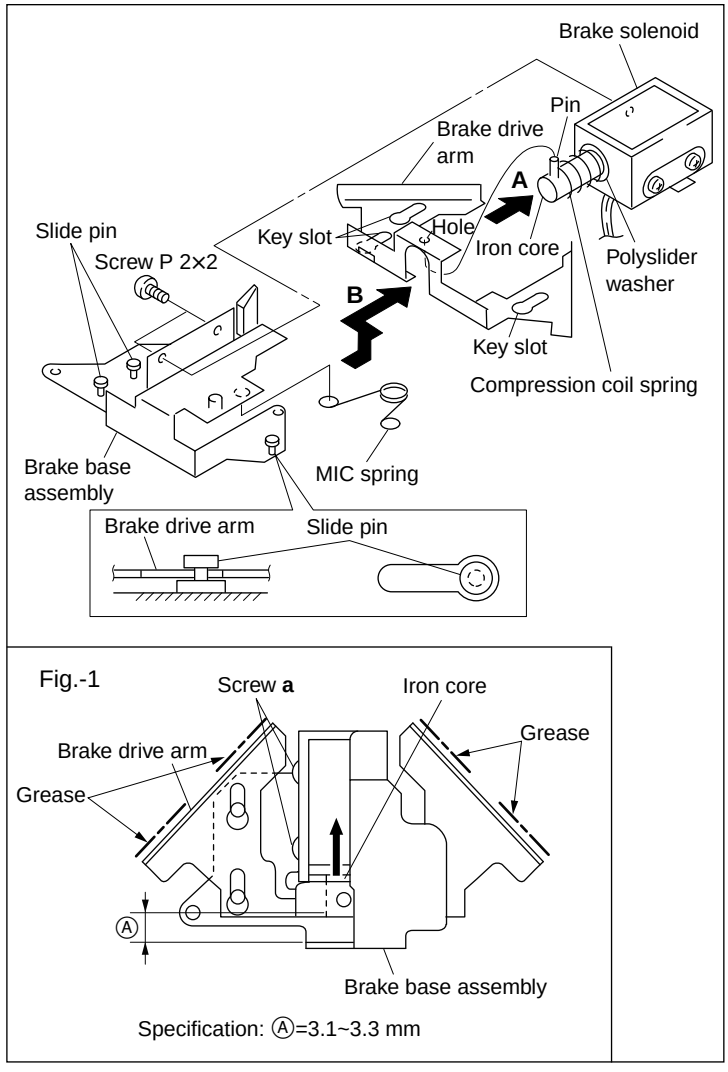


Fig.-1

Specification: Ⓐ=3.1~3.3 mm

6-7. BRAKE SOLENOID REPLACEMENT

- Replace the brake solenoid referring to section “6-6. BRAKE BASE ASSEMBLY REPLACEMENT”.
- Remove the compression coil spring, polyslider washer, and supporter from the old solenoid and reuse them.

6-8. PINCH ROLLER REPLACEMENT

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Grease (SGL-505) : 7-662-010-04

Mode

EJECT

Removal

1. Remove the stop washer 1.5, and remove the pinch limiter assembly.

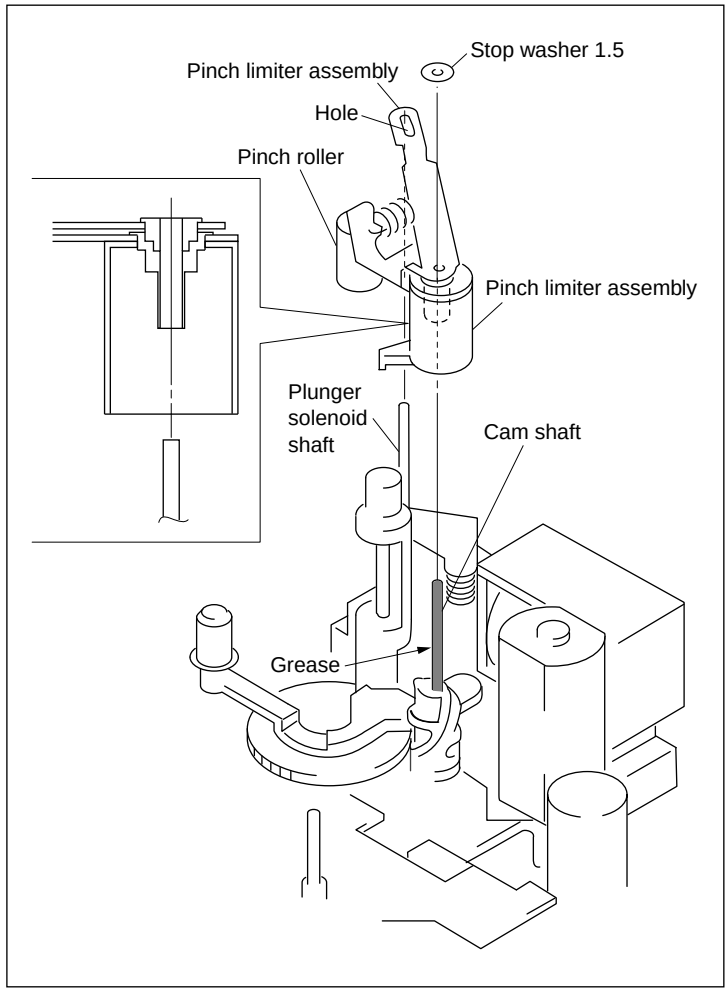
Note : The compression coil spring may come off with the pinch limiter assembly when removing it.

Attachment

2. Clean the pinch roller of the new pinch limiter assembly with the cleaning cloth moistened with cleaning fluid.
3. Coat the ▬ area of the cam shaft with grease.
4. Insert the pinch limiter assembly into the cam shaft of the MD chassis and insert the hole of the pinch limiter arm into the plunger solenoid shaft. Fix them with the stop washer 1.5.

Adjustment After Replacement

5. Perform the tape path adjustment. (Refer to section 7.)



6-9. ELEVATOR CAM REPLACEMENT

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Mode

EJECT

Removal

1. Remove the pinch limiter assembly.
   (Refer to section 6-8.)

   Note : The compression coil spring may come off with the pinch limiter assembly when removing it.

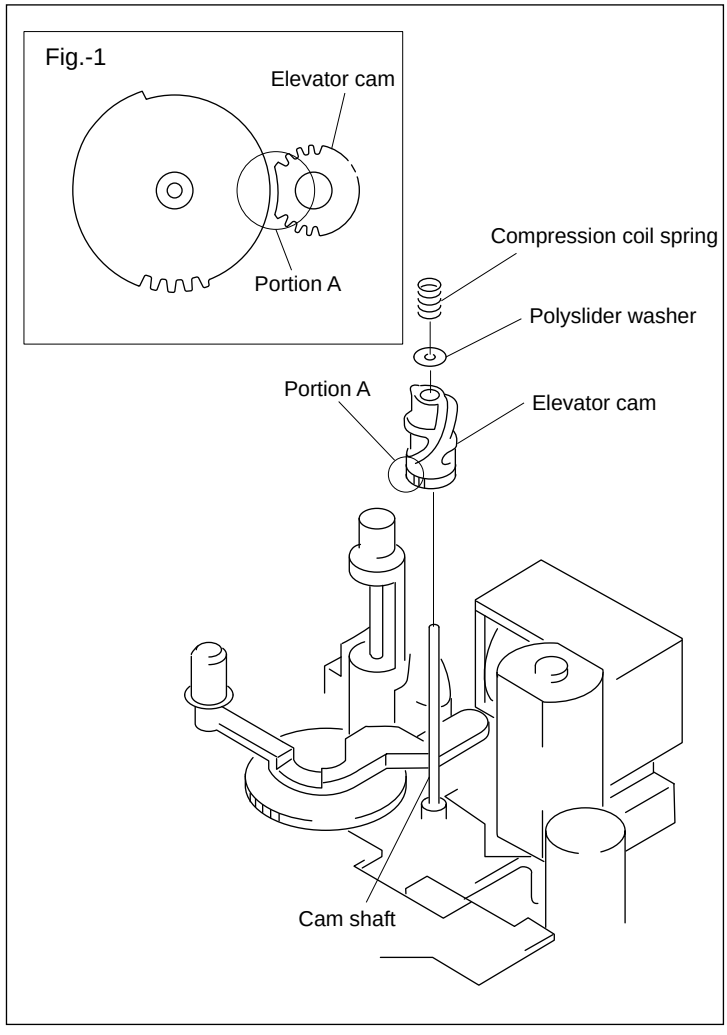
2. Remove the compression coil spring from the cam shaft.
3. Remove the elevator cam from the cam shaft together with the polyslider washer.

Attachment

4. Clean the cam shaft with the cleaning cloth moistened with cleaning fluid.
5. Insert the new elevator cam and polyslider washer into the cam shaft.
6. Insert the compression spring into the cam shaft.
7. Attach the pinch limiter assembly.
   (Refer to section 6-8.)

Adjustment After Replacement

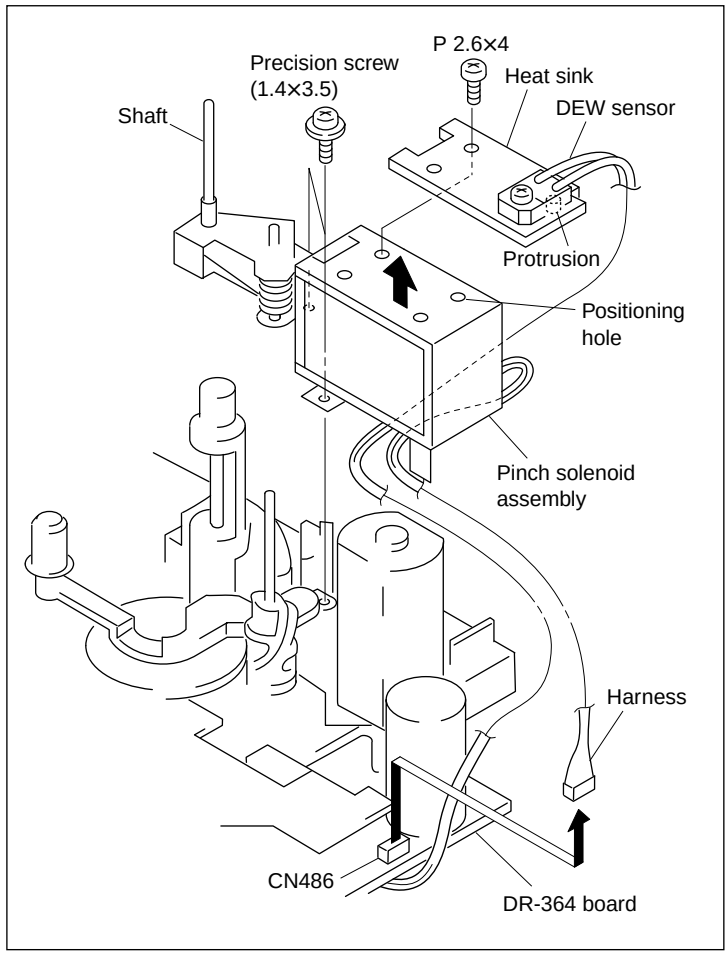
8. Perform the tape path adjustment.
   (Refer to section 7.)



6-10. PINCH SOLENOID ASSEMBLY REPLACEMENT

Removal

1. Remove the pinch roller. (Refer to section 6-9.)
2. Remove the connector (CN486) from the DR-364 board.
3. Remove the screw (P 2.6×4) and remove the heat sink.
4. Remove the two precision screws (1.4×3.5) and remove the pinch solenoid assembly in the direction of the arrow.



Attachment

5. Insert the shaft of the new pinch solenoid assembly into the hole of the pinch arm limiter, align the two holes with the position setting pin of the MD chassis and fix them with the two precision screws (1.4×3.5).

   Note : Carefully route the harness around the pinch solenoid assembly so that it is not pinched by any parts.

6. Insert the harness of the pinch solenoid into the DR-364 board (CN486).
7. Align the heat sink positioning protrusion with the positioning hole of the pinch solenoid assembly, and secure them by the screw (P 2.6×4).

Adjustment After Replacement

8. Perform the tape path check/adjustment. (Refer to section 7.)

6-11. SUPPLY TENSION REGULATOR ASSEMBLY REPLACEMENT

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Reference plate : J-6442-990-A
Guide gauge : J-6442-420-A

Mode

EJECT

Removal

1. Remove the S4 arm assembly. (Refer to section 6-13.)
2. Remove CN462 and CN1 from the SE-462 board, and remove the SE-462 board by removing the three precision screws.
3. Remove the two screws from the MD chassis and remove the tension regulator assembly.

Attachment

4. Engage the gear of the new tension regulator assembly with the TR limiter gear as shown in Fig.-1.
5. Coat the ▬ area of the S tension regulator assembly with grease. (Fig.-1)
6. Set the DSR-70/70P to the threading state.
7. Check that the tape guides are not slanted and bent. (Refer to section 6-11-1.)
8. Check height of the tape guides. (Refer to section 6-11-1.)
9. Clean the roller using the cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

- Perform the tape tension adjustment. (Refer to section 4.)
- Perform the tape path adjustment. (Refer to section 7.)

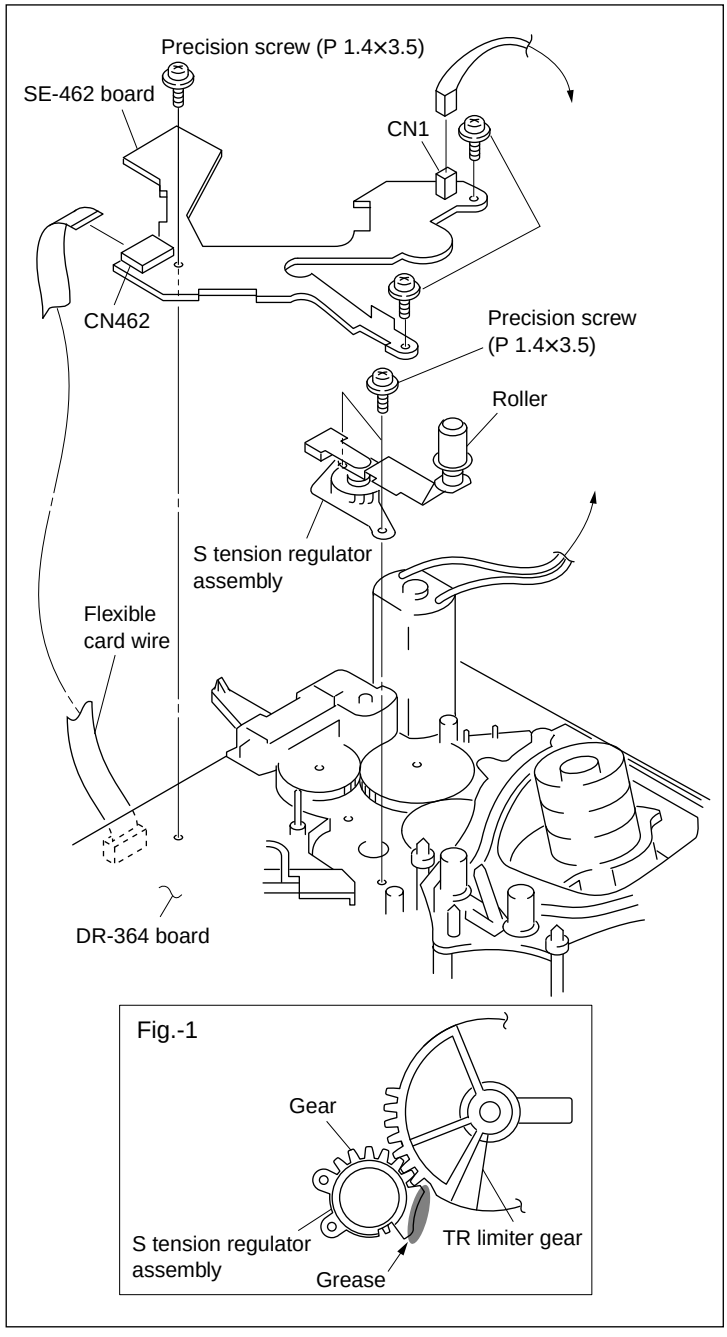


Fig.-1

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6-11-1. Guide Height/Slantness Adjustment

This section describes each of the tape guide adjustments of S3 (S tension regulator), S4 (S4 arm assembly), T3 (T drawer arm assembly), and T4 (T4 arm assembly).

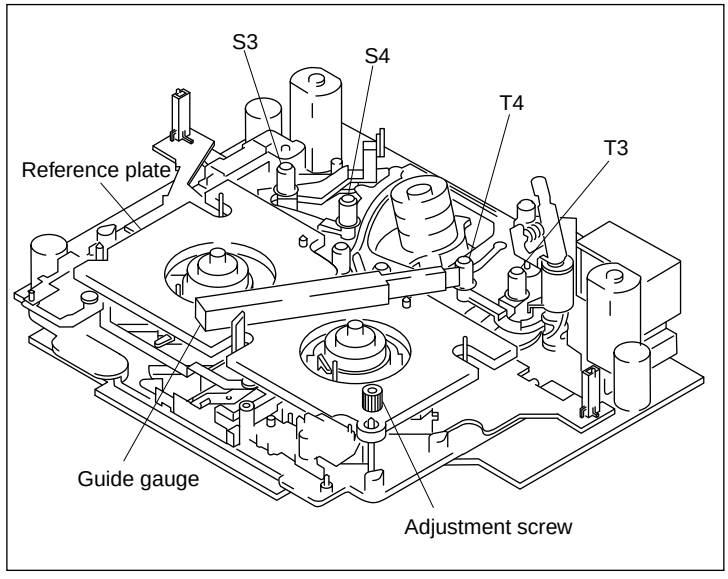
Reel table position : Standard cassette position
Mode : Threaded end

Tools

Reference plate : J-6442-990-A
Guide gauge : J-6442-420-A
Tape guide adjustment screwdriver : J-6082-362-A

The method of checking and adjusting the height of each of the following guides is described below.

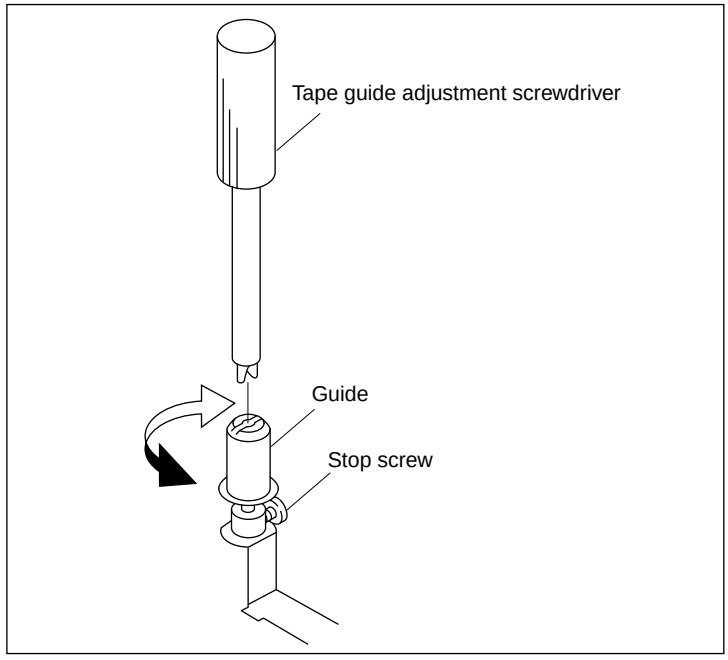
S3 guide
(Controls the guide height on the bottom flange)
S4 guide
(Controls the guide height on the bottom flange)
T3 guide
(Controls the guide height on the bottom flange)
T4 guide
(Controls the guide height on the bottom flange)



Adjustment

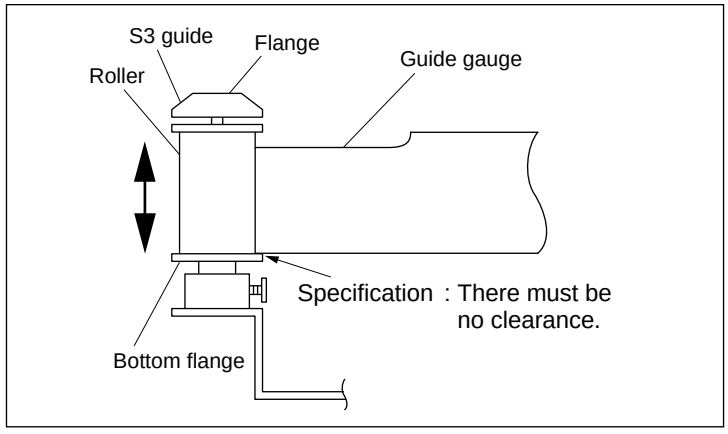
1. Clean the surface of the reference plate and the guide gauge using the cleaning cloth moistened with cleaning fluid.
2. Place the reference plate in the position where a cassette must be placed. Eliminate any play using the adjustment screws.
3. Loosen the stop screws of each guide, and turn the guide in the direction of the arrow using the tape guide adjustment screwdriver to adjust the height.
4. After adjustment, tighten the stop screws.

Note : Perform check and adjustment in accordance with the adjustment procedure of the respective guides.



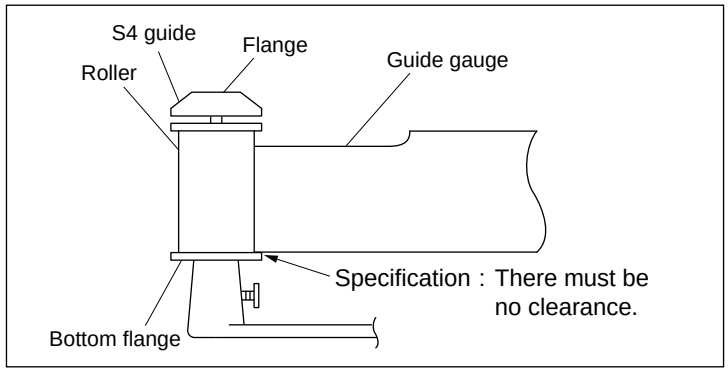
S3 Guide (S Tension Regulator)

5. Place the guide gauge on the reference plate, and gently press the S3 guide as shown in the figure. Confirm that the roller is not slanted.
6. Press the guide gauge as well and confirm that the guide gauge contacts the bottom flange so that there is no clearance between them.
7. If the specification is not satisfied, turn the flange to adjust the height until the specification is satisfied.
8. Adjust the lower flange height, and turn the flange by 180° ↺ counter-clockwise.



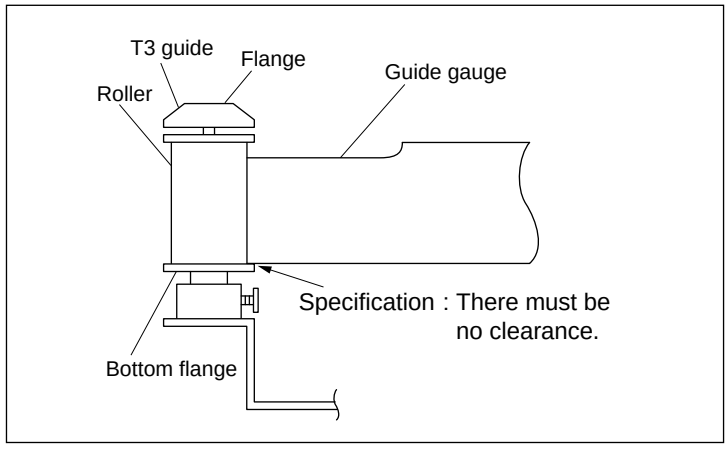
S4 Guide (S4 Arm Assembly)

5. Place the guide gauge on the reference plate, and gently press the S4 guide as shown in the figure. Confirm that the roller is not slanted.
6. Press the guide gauge as well and confirm that the guide gauge contacts the bottom flange so that there is no clearance between them.
7. If the specification is not satisfied, turn the flange to adjust the height until the specification is satisfied.



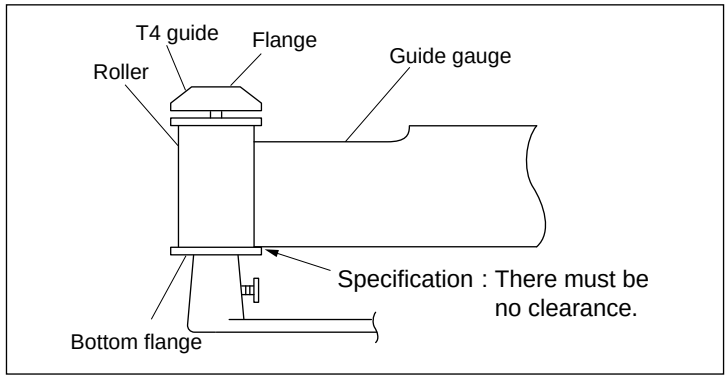
T3 Guide (T Drawer Arm Assembly)

5. Place the guide gauge on the reference plate, and gently press the T3 guide as shown in the figure. Confirm that the roller is not slanted.
6. Press the guide gauge as well and confirm that the guide gauge contacts the bottom flange so that there is no clearance between them.
7. If the specification is not satisfied, turn the flange to adjust the height until the specification is satisfied.



T4 Guide (T4 Arm Assembly)

5. Place the guide gauge on the reference plate, and gently press the T4 guide as shown in the figure. Confirm that the roller is not slanted.
6. Press the guide gauge as well and confirm that the guide gauge contacts the bottom flange so that there is no clearance between them.
7. If the specification is not satisfied, turn the flange to adjust the height until the specification is satisfied.



6-12. T DRAWER ARM ASSEMBLY REPLACEMENT

Note : Be careful not to let the guide roller touch the surrounding parts and damage them.

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Reference plate : J-6442-990-A
Guide gauge : J-6442-420-A

Mode

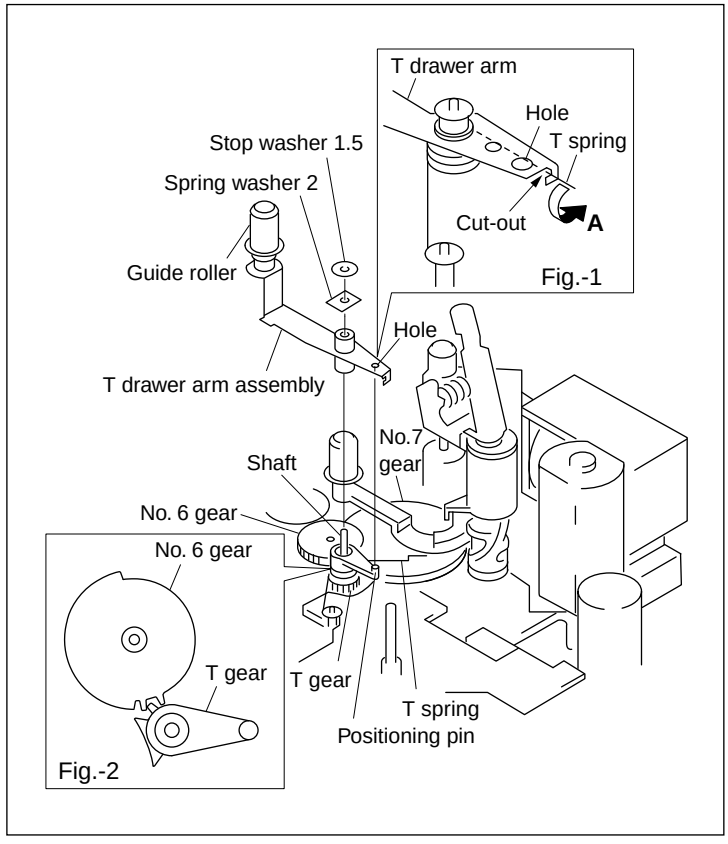
EJECT

Removal

1. Remove the T spring from the cut-out of the T drawer arm assembly in the direction of **A**.
2. Remove the stop washer 1.5 from the MD chassis. Remove the spring washer 2 and the T drawer arm assembly.

Attachment

3. Align the T gear with the No. 6 gear as shown in Fig.-2.
4. Insert the new T drawer arm assembly into the shaft of the T gear in such a way that the T gear's position setting pin enters into the hole of the new T drawer arm assembly.
5. Pass the spring washer 2 through the T gear shaft, and attach the stop washer 1.5.
6. Hook the T spring on the cut-out of the T drawer arm assembly.
7. Set the DSR-70/70P to the threading state.
8. Perform the tape guides slantness adjustment. (Refer to section 6-11-1.)
9. Perform the tape guides height adjustment. (Refer to section 6-11-1.)
10. Clean the roller using the cleaning cloth moistened with cleaning fluid.



Adjustment After Replacement

Perform the tape path adjustment.
(Refer to section 7.)

6-13. S4 ARM ASSEMBLY REPLACEMENT

Note : • Carefully handle the TG1 arm assembly because its tape cleaner has sharp edges.
• Be careful not to let the guide roller and tape cleaner touch the surrounding parts and damage them.

Tools

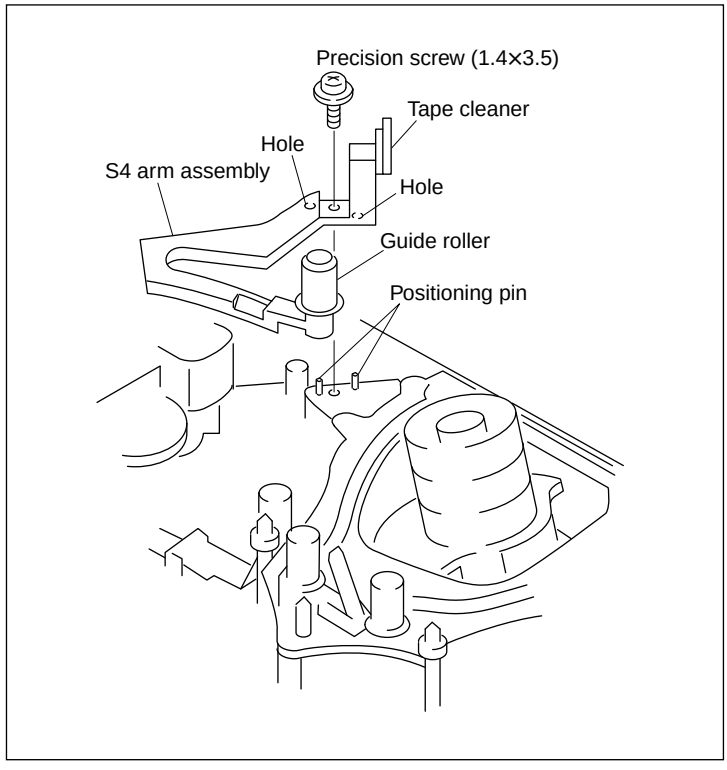
Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Reference plate : J-6442-990-A
Guide gauge : J-6442-420-A

Removal

1. Remove the screw from the MD chassis, and remove the S4 arm assembly.

Attachment

2. Align the two holes of the new S4 arm assembly with the positioning pins of the MD chassis, and attach the new S4 arm assembly with the precision screw.
3. Set the DSR-70/70P to the threading state.
4. Perform the tape guides slantness adjustment. (Refer to section 6-11-1.)
5. Perform the tape guides height adjustment. (Refer to section 6-11-1.)
6. Clean the guide roller of the S4 arm assembly and the tape cleaner using the cleaning cloth moistened with cleaning fluid.



Adjustment After Replacement

Perform the tape path adjustment.
(Refer to section 7.)

6-14. T4 ARM ASSEMBLY REPLACEMENT

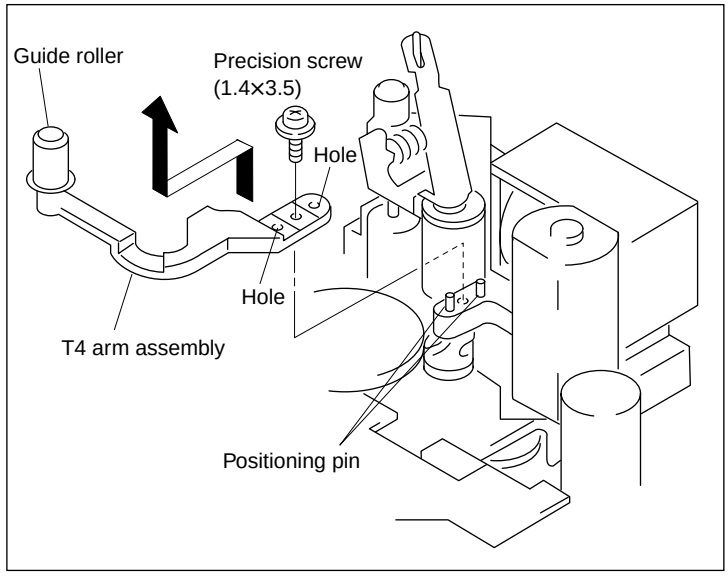
Note : Be careful not to let the guide roller touch the surrounding parts and damage them.

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01
Reference plate : J-6442-990-A
Guide gauge : J-6442-420-A

Removal

1. Remove the screw from the MD chassis and remove the T4 arm assembly in the direction of the arrow.



Attachment

2. Align the two holes of the new T4 arm assembly with the positioning pins of the MD chassis, and attach the new T4 arm assembly with the precision screw.
3. Set the DSR-70/70P to the threading state.
4. Perform the tape guides slantness adjustment. (Refer to section 6-11-1.)
5. Perform the tape guides height adjustment. (Refer to section 6-11-1.).
6. Clean the guide roller of the T4 arm assembly using the cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

Perform the tape path adjustment.
(Refer to section 7.)

6-15. RAIL ASSEMBLY REPLACEMENT

Note : Be careful not to let the guide roller touch the surrounding parts and damage them.

1. Remove the S tension regulator assembly. (Refer to section 6-11.)
2. Remove the connector (CN464) from the SE-463 board.
3. Remove the precision screw that fixes the flexible card wire of the LED holder assembly.
4. Remove the T drawer arm assembly. (Refer to section 6-12.)

Note :
- **Handle the flexible card wire with utmost care. Do not apply force because it is very fragile.**
- **Be careful not to scratch the drum surface.**

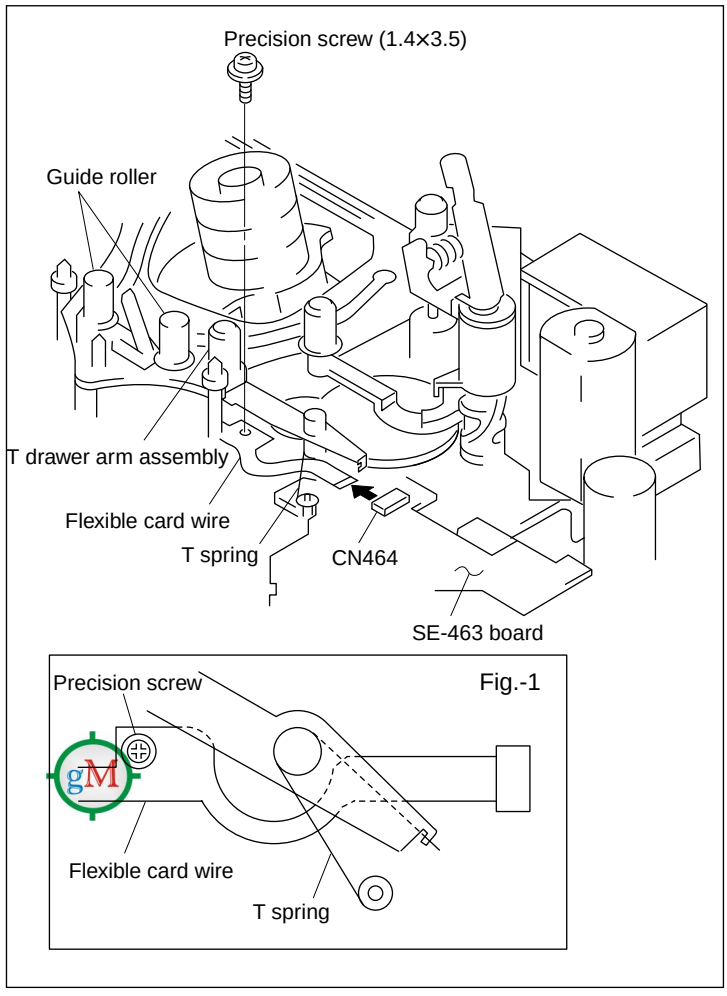
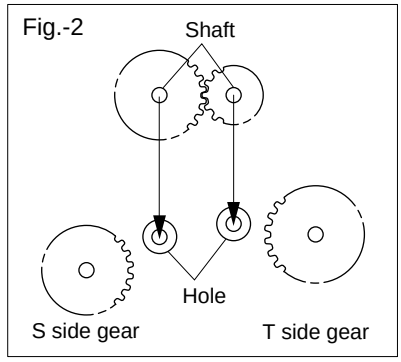


Fig.-1

5. Remove the three screws from the MD chassis and remove the rail assembly together with the LED holder assembly.

Note : When removing the rail assembly, turn the gear manually to align the phase-setting hole of the mode gear assembly and that of the No. 3 gear with the corresponding phase-setting holes of the MD chassis respectively. (Fig.-3)

Fig.-2



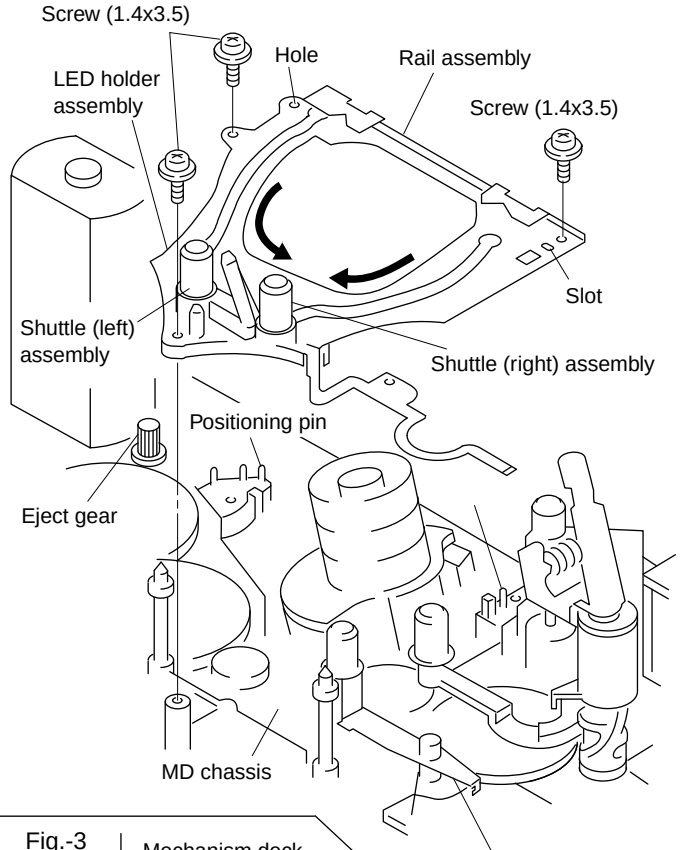
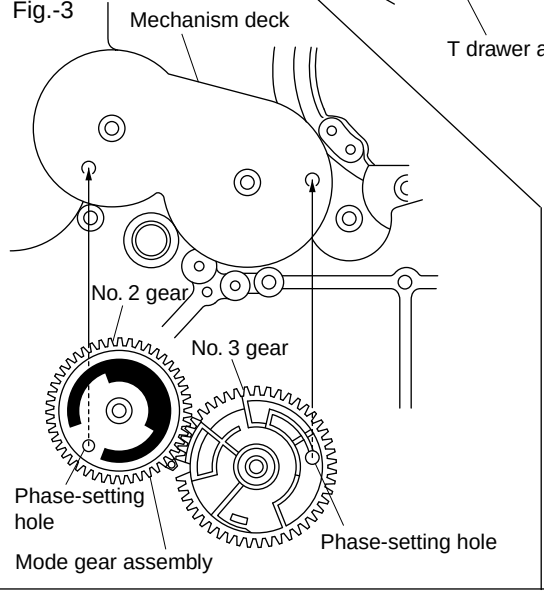


Fig.-3



6. Remove the two claws of the LED holder assembly. Remove the LED holder assembly from the rail assembly.
7. Remove the shuttle (left) assembly. (Refer to section 6-16.)
8. Remove the shuttle (left) assembly. (Refer to section 6-17.)

Removal

9. Attach the LED holder assembly to the new rail assembly by engaging the two claws. (Fig.-4)
10. Attach the removed parts by reversing the removal procedure from step 8 to 7.
11. Move the two shuttle assemblies of the rail assembly in the direction of the arrow until it contacts the LED holder.

    Note : When moving the shuttle assemblies, turn the gear manually to align the phase-setting hole of the mode gear assembly and that of the No. 3 gear with the corresponding phase-setting holes of the MD chassis respectively.

12. Align the phase-setting hole of the No. 3 gear and that of the No. 4 gear with the corresponding phase-setting holes of the MD chassis respectively using fingers. (Fig.-5)
13. Insert the hole and the slot of the rail assembly into the two position-setting pins of the MD chassis respectively. Adjust phase of the S-side gear with that of the T-side gear as shown in Fig.-2 and insert the shuttle block shaft. Fix it with the three screws. (Fig.-2)
14. Pass the flexible card wire under the T spring. (Fig.-1)
15. Attach the removed parts by reversing the removal procedure from step 3 to 1.

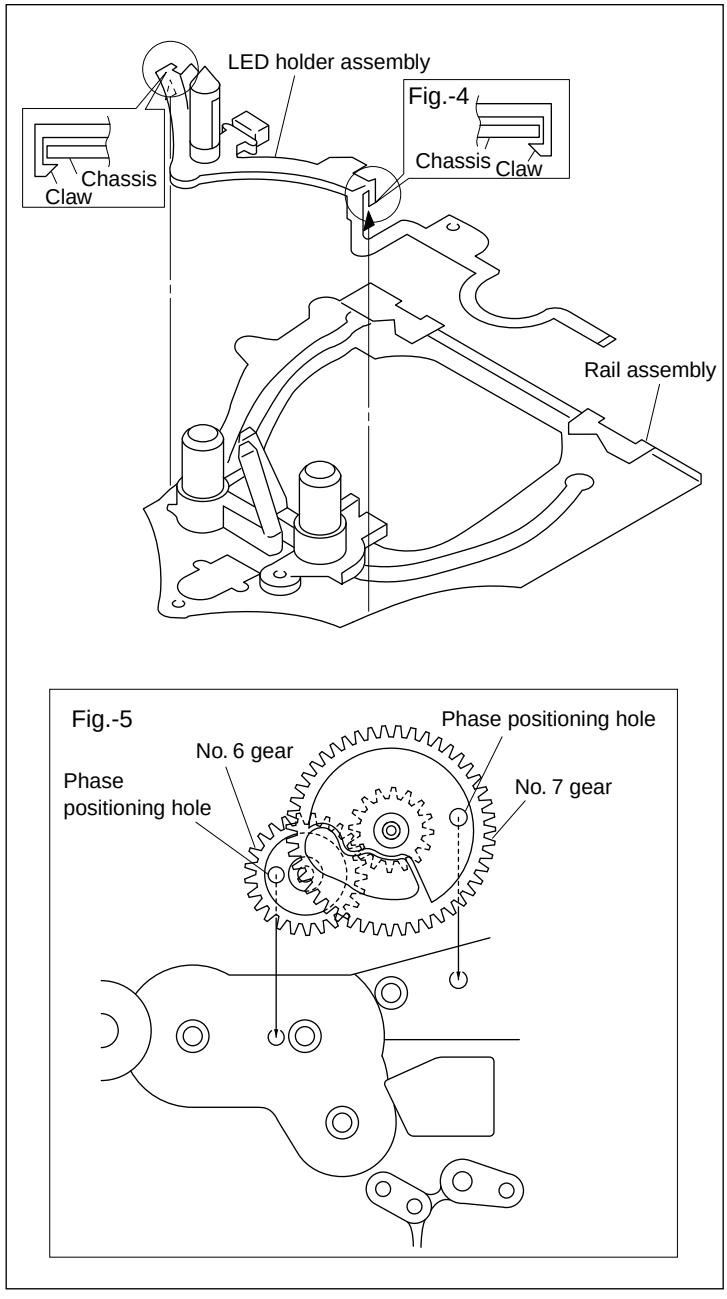
Check After Attachment

- Revolve the gear until the DSR-70/70P is set to the unthreading state.
- Confirm that the T drawer arm assembly returns to the EJECT position.
- Press the No. 7 gear to confirm that it does not rotate freely.
- Revolve the gear in the clockwise direction to confirm that the shuttle (right) assembly does not contact the T drawer arm during loading.

16. Clean the shuttle (left)/(right) assemblies using the cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

17. Perform the Tape Path Adjustment. (Refer to section 7.)



6-16. SHUTTLE (LEFT) ASSEMBLY REPLACEMENT

Note : Be careful not to let the guide roller touch the surrounding parts so as not to damage them.

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

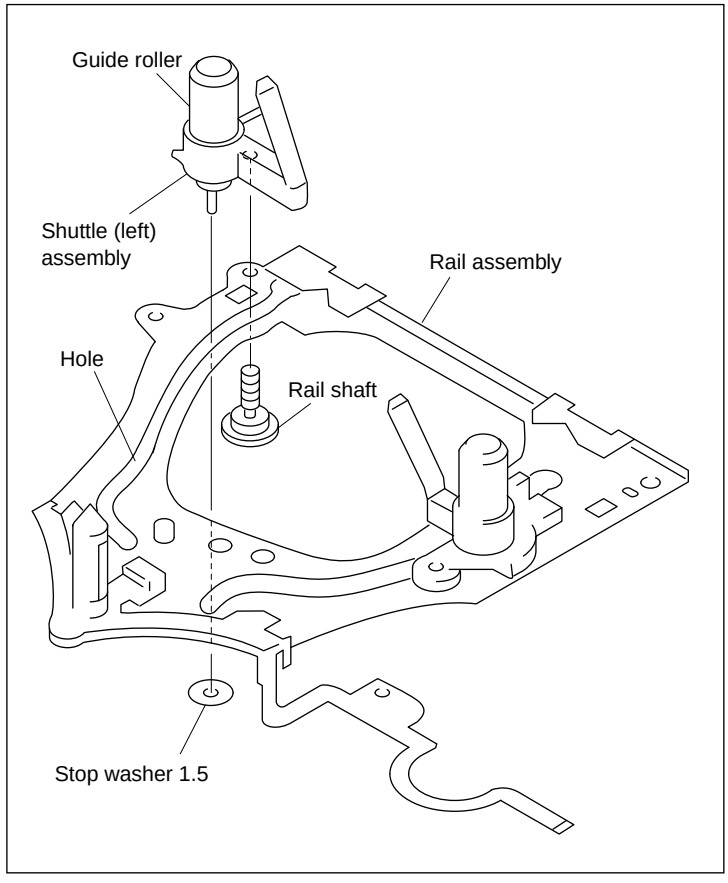
1. Remove the rail assembly from the MD chassis. (Refer to section 6-15.)
2. Remove the rail shaft and the stop washer 1.5 from the rail assembly. Then remove the shuttle (left) assembly.

Attachment

3. Attach the new shuttle (left) assembly to the rail assembly using the rail shaft.
4. Attach the rail assembly to the MD chassis assembly. (Refer to section 6-15.)
5. Clean the shuttle (left) assembly using the cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

6. Perform the tape path adjustment. (Refer to section 7.)



6-17. SHUTTLE (RIGHT) ASSEMBLY REPLACEMENT

Note : Be careful not to let the guide roller touch the surrounding parts so as not to damage them.

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

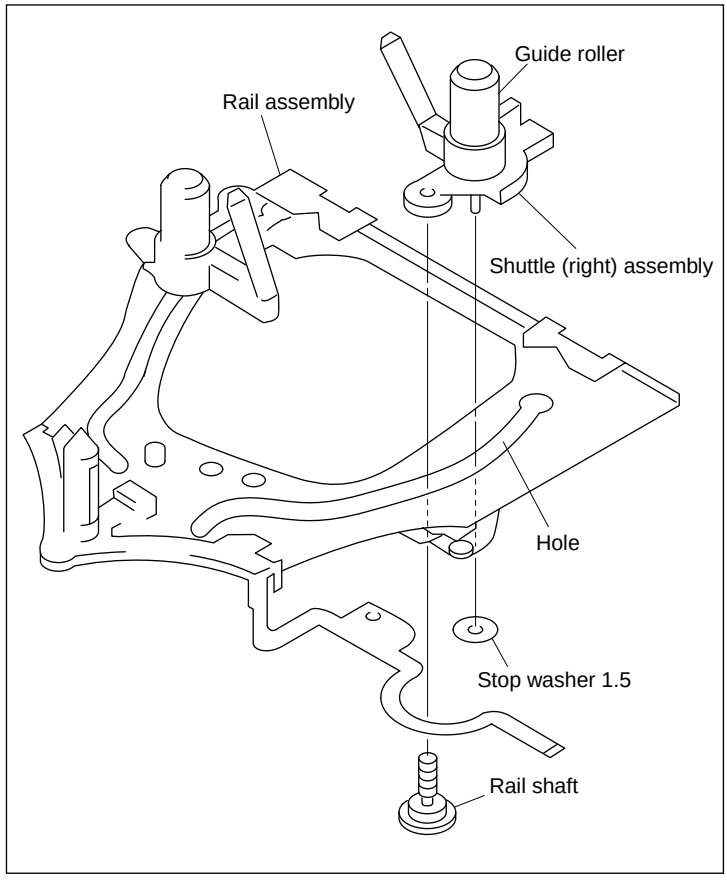
1. Remove the rail assembly from the MD chassis. (Refer to section 6-15.)
2. Remove the rail shaft and the stop washer 1.5 from the rail assembly. Then remove the shuttle (right) assembly.

Attachment

3. Attach the new shuttle (right) assembly to the rail assembly using the rail shaft.
4. Attach the rail assembly to the MD chassis assembly. (Refer to section 6-15.)
5. Clean the shuttle (right) assembly using the cleaning cloth moistened with cleaning fluid.

Adjustment After Replacement

6. Perform the tape path adjustment. (Refer to section 7.)



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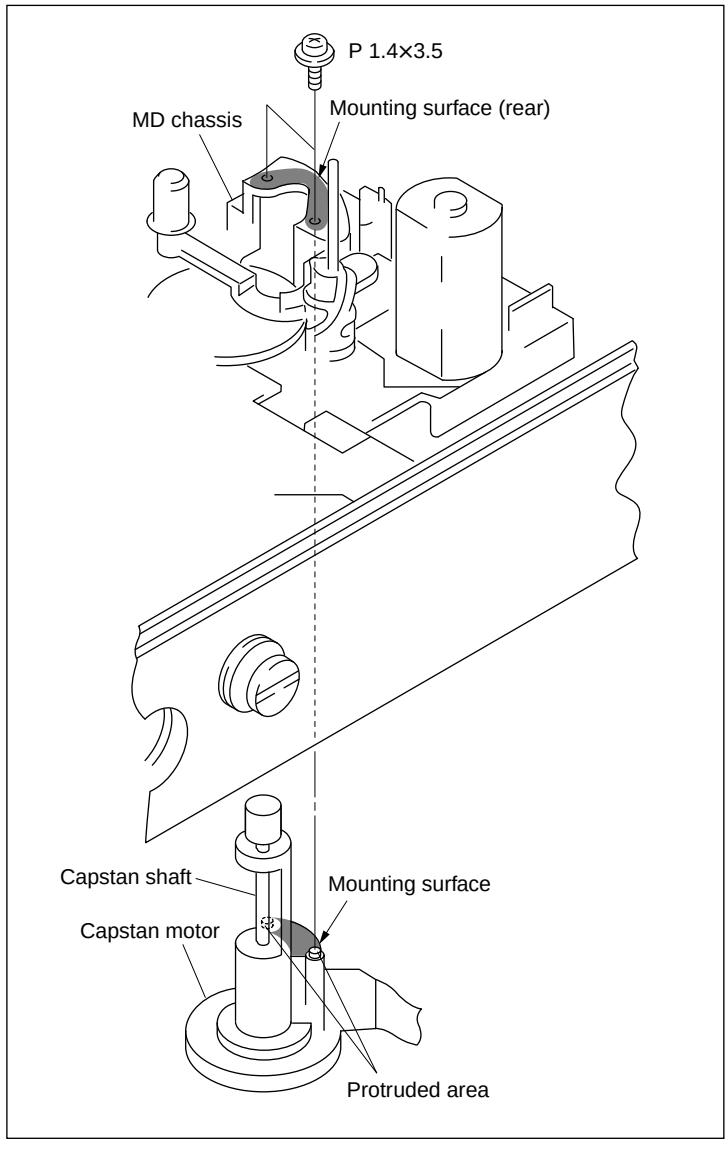
6-18. CAPSTAN MOTOR REPLACEMENT

Tools

Cleaning cloth : 3-184-527-01
Cleaning fluid : 9-919-573-01

Removal

1. Place the DSR-70/70P with its left side down.
2. Remove the bottom plate assembly.
   (Refer to section 2-6-3.)
3. Remove the DR-364 board.
   (Refer to section 2-8-9.)
4. With the pinch limiter shaft and the pinch limiter arm of the MD chassis moved aside remove the two screws from the bottom as shown and remove the capstan motor.



Attachment

Note : Be careful not to damage the capstan shaft.

5. Clean the mounting surface of the new capstan motor and that of the MD chassis using the cleaning cloth moistened with cleaning fluid.
6. Insert the new capstan motor from the rear. Insert the two protrusions of the capstan motor into the corresponding holes of the MD chassis. Fix the capstan motor with the two screws from the front.
7. Attach the removed parts by reversing the removal procedure from step 3 to 1.
8. Clean the capstan shaft.

Adjustment After Replacement

9. Perform the capstan FG duty adjustment.
   (Refer to section 4.)
10. Perform the tape path adjustment.
    (Refer to section 7.)

6-19. THREADING MOTOR REPLACEMENT

Removal

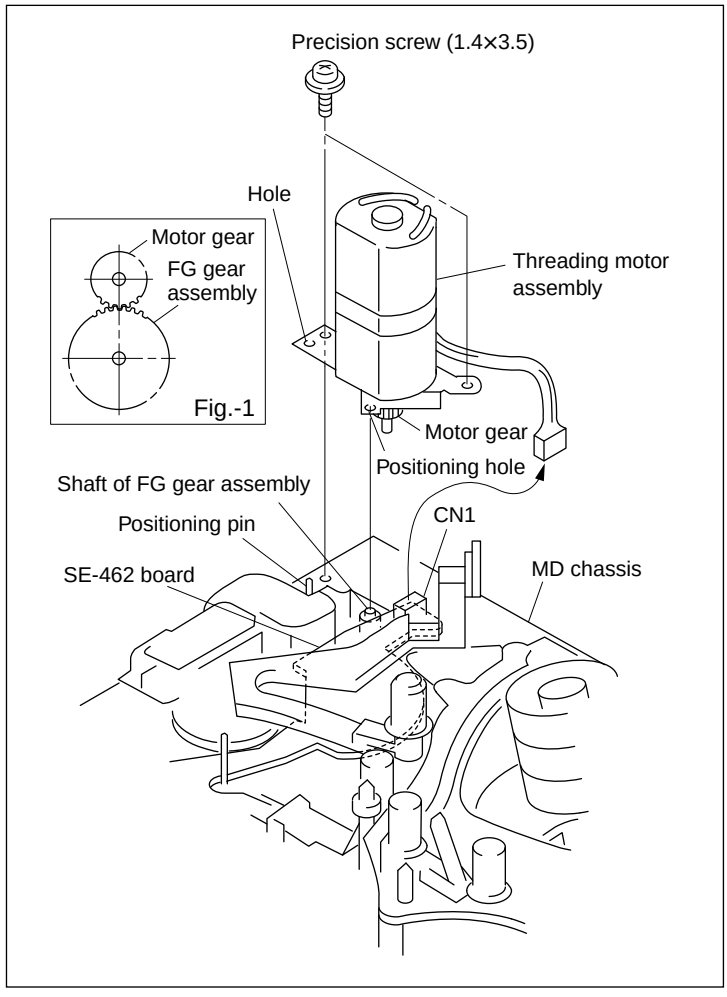
1. Remove the connector (CN1) from the SE-462 board.
2. Remove the two precision screws from the MD chassis and remove the threading motor assembly.

Attachment

3. Coat the entire gear surface of the new threading motor assembly with grease.
4. Insert the hole of the threading motor assembly into the positioning pin of the MD chassis. Engage the motor gear with the FG gear assembly. Insert the positioning hole into the shaft of the FG gear assembly. (Fig.-1)

   Note :
   - **At this moment, attach the threading motor while pushing in the manual gear.**
   - **Be sure not to pinch the SE-462 board.**

5. Fix the threading motor assembly to the MD chassis with the two precision screws.



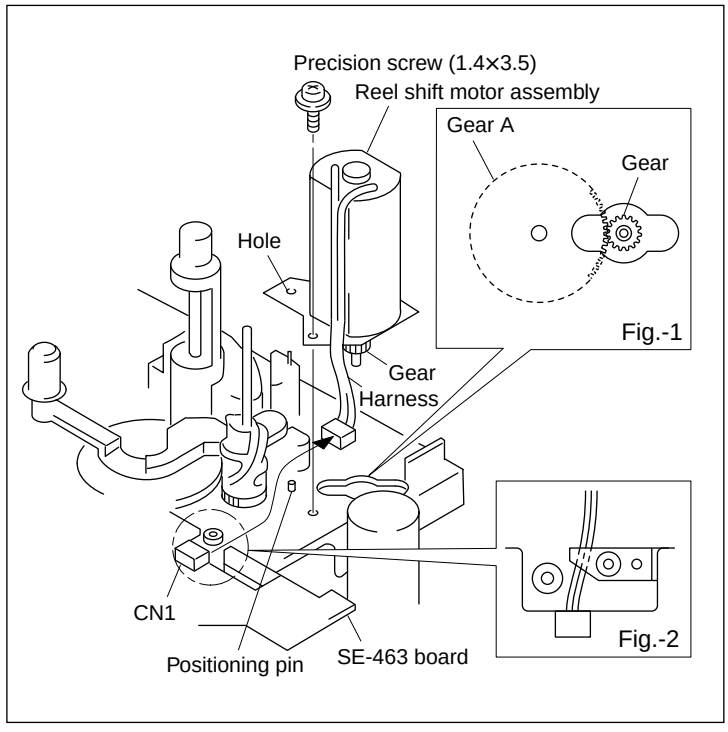
6-20. REEL SHIFT MOTOR ASSEMBLY REPLACEMENT

1. Remove the pinch solenoid assembly. (Refer to section 6-10.)
2. Remove the connector (CN1) from the SE-463 board.
3. Remove the precision screw from the MD chassis and remove the reel shift motor assembly.

Attachment

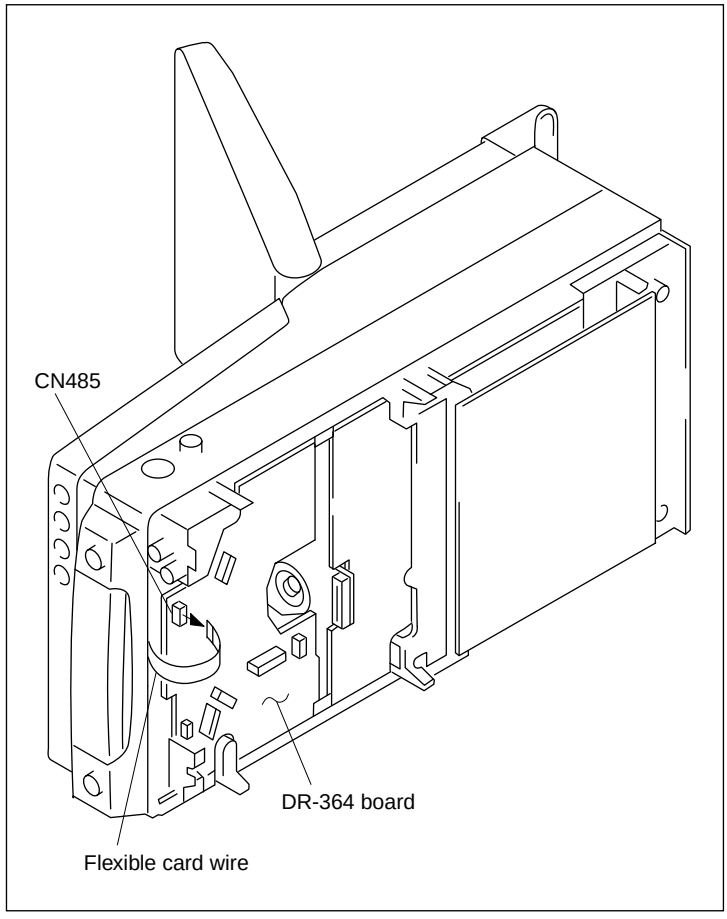
4. Attach the new reel shift motor assembly to the MD chassis with precision screw as shown in Fig.-1.
5. Attach the removed parts by reversing the removal procedure from step 2 to 1.

Note : Be careful not to damage the jacket of the harness when routing it. (Fig.-2)



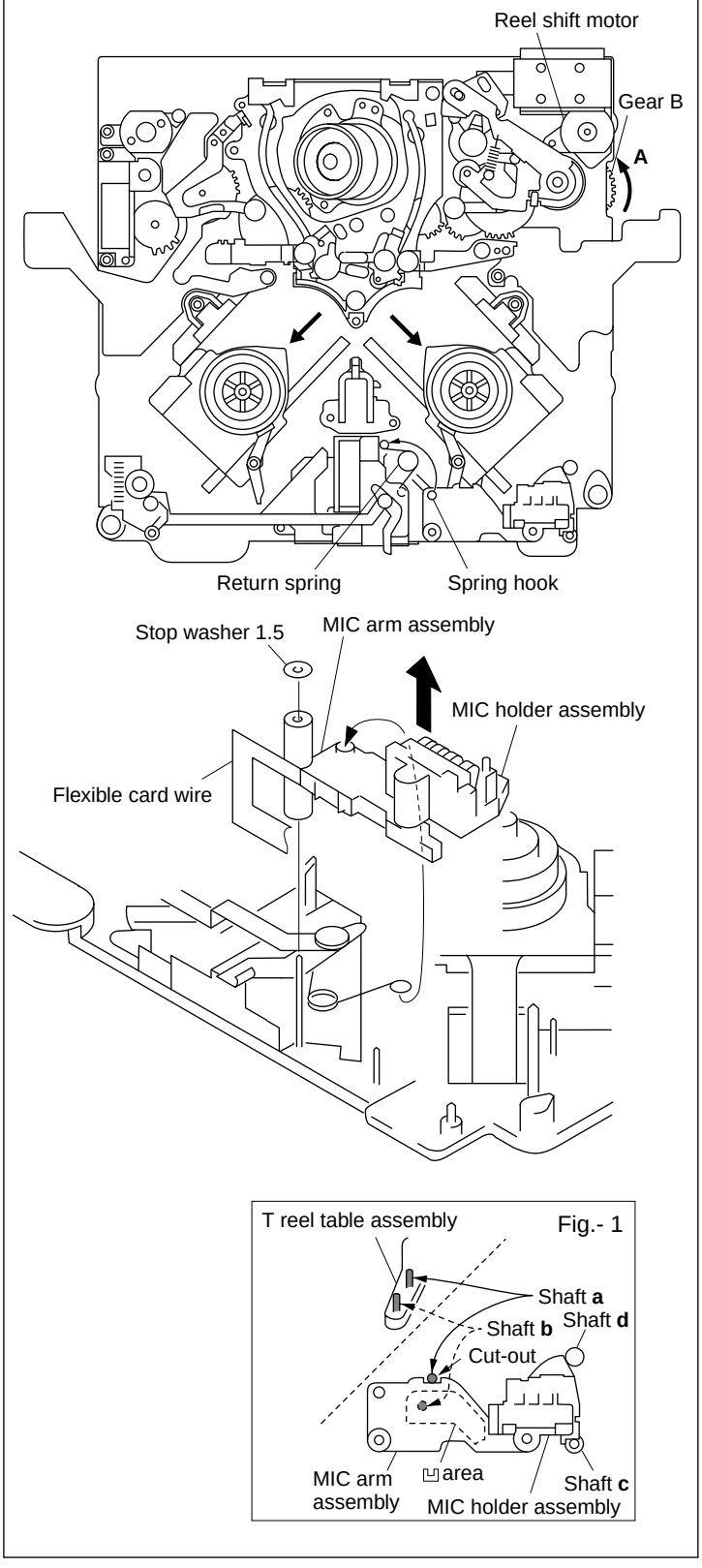
6-21. MIC HOLDER ASSEMBLY REPLACEMENT

1. Place the DSR-70/70P with its left side down, and remove the bottom panel assembly. (Refer to section 2-6-3.)
2. Remove the flexible card wire from the connector (CN485) of the DR-364 board.



3. Place the DSR-70/70P horizontally.
4. Revolve the gear B of the reel shift motor with fingers in the direction **A** until the T reel table assembly is moved to the position where a reference cassette is placed.
5. Remove the return spring of the MIC arm assembly from the spring hook.
6. Remove the stop washer 1.5 from the MD chassis and remove the MIC arm assembly.

Note : Be careful not to damage the flexible card wire when removing it.

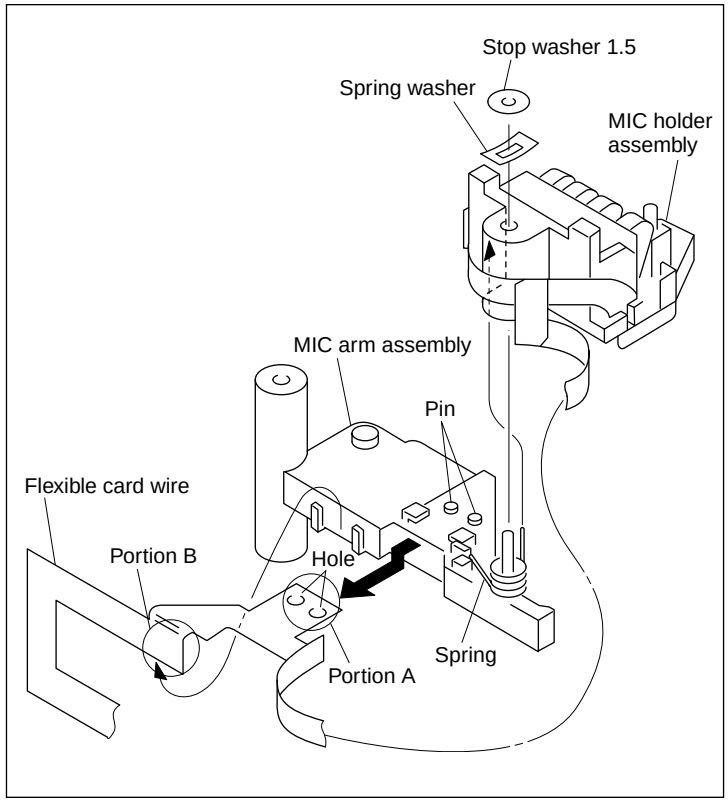


7. Remove the portions A and B of the flexible card wire from the MIC assembly in the direction of the arrow.
8. Remove the stop washer 1.5 and the spring washer from the MIC arm assembly and remove the MIC holder assembly.

Attachment

9. While engaging the spring on the new MIC holder assembly, insert the spring washer and attach it to the MIC arm assembly with the stop washer 1.5.
10. Attach the MIC arm assembly and the MIC holder assembly to the MD chassis with the stop washer 1.5 as shown in Fig.-1.
11. Attach the removed parts by reversing the removal procedure from step 2 to 1.

Note : Be careful that the spring should not be pinched when inserting the MIC holder assembly.
After replacing the MIC holder assembly, check that it operates correctly.



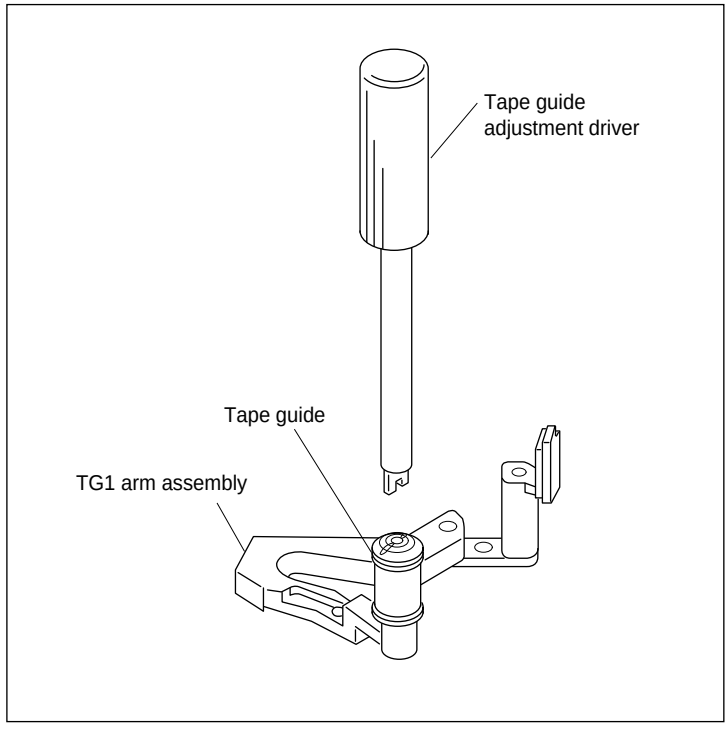
SECTION 7
TAPE PATH ADJUSTMENT

Tape path adjustment is very important adjustment to run tape under the optimum conditions for tape.
If this adjustment is not performed correctly, tape can be damaged.
Perform this adjustment with utmost attention.
Perform this adjustment after cassette compartment is removed from VTR.

7-1. GENERAL INFORMATION FOR TAPE PATH ADJUSTMENT

Required tools

1. Alignment tape
   The following alignment tapes are necessary for tape path adjustment.
   - XH2-1AST (Standard cassette) : 8-967-999-02
   - XH5-1A (Standard cassette) : 8-967-999-21 (NTSC)
   - XH5-1AP (Standard cassette) : 8-967-999-25 (PAL)
2. Tape guide adjustment driver
   The following tape guide adjustment driver which is available as the Sony service tool is necessary for height adjustment of tape guide.
   - Tape guide adjustment driver : J-6082-362-A
3. The required tools in addition to the above listed tools.
   - Oscilloscope (Tektronix 2445B or equivalent)
   - Small mirror for adjustment : J-6080-710-A
   - Cleaning cloth : 3-184-527-01
   - Cleaning fluid : 9-915-573-01
   - Blank tape
     (Commercially available tape, SONY DVM30 ME or equivalent)

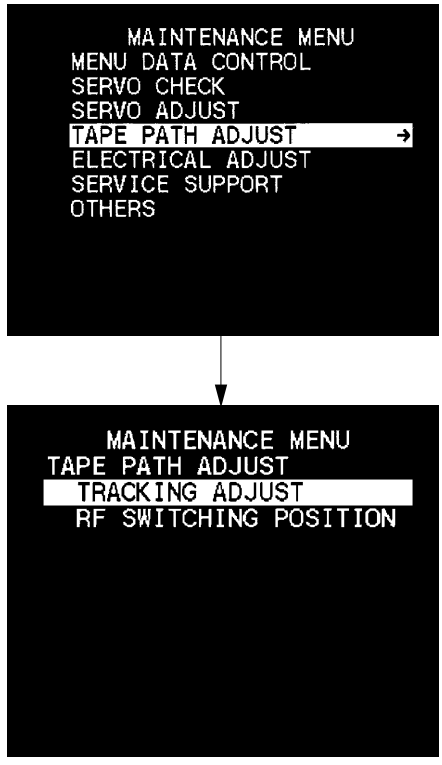


Preparation of Tape Path Adjustment

4. Cassette compartment
   Perform the tape path adjustment after cassette compartment is removed from VTR. When a cassette is set on the VTR, place a weight (about 300 g) on a cassette so that a cassette is securely fixed in position.
5. Cleaning the tape contact
   (1) Clean the tape running surface of tape guides, head drum and video head using the cleaning cloth moistened with cleaning fluid.
   Cleaning cloth : 3-184-527-01
   Cleaning fluid : 9-919-573-01

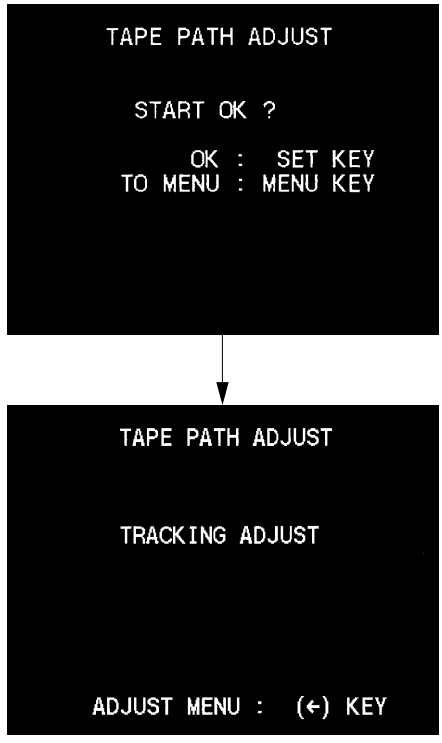
6. Information to use the tracking alignment tape (XH2-1AST)
   (1) Check the following contents of this manual before using the tracking adjustment mode.
   - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
   - For the procedure to exit the maintenance menu, refer to sections 4-2-3.

7. Operating procedure of tracking adjustment
   (1) Enter the maintenance menu.
   (2) Move the cursor to “TAPE PATH ADJUST” which is displayed with a white background, using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
   (3) Press the [OUT] (→) key.
   This selects “TAPE PATH ADJUST” and menu of the lower level directory appears.



   (4) Move the cursor to “TRACKING ADJUST” which is displayed with a white background, using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.

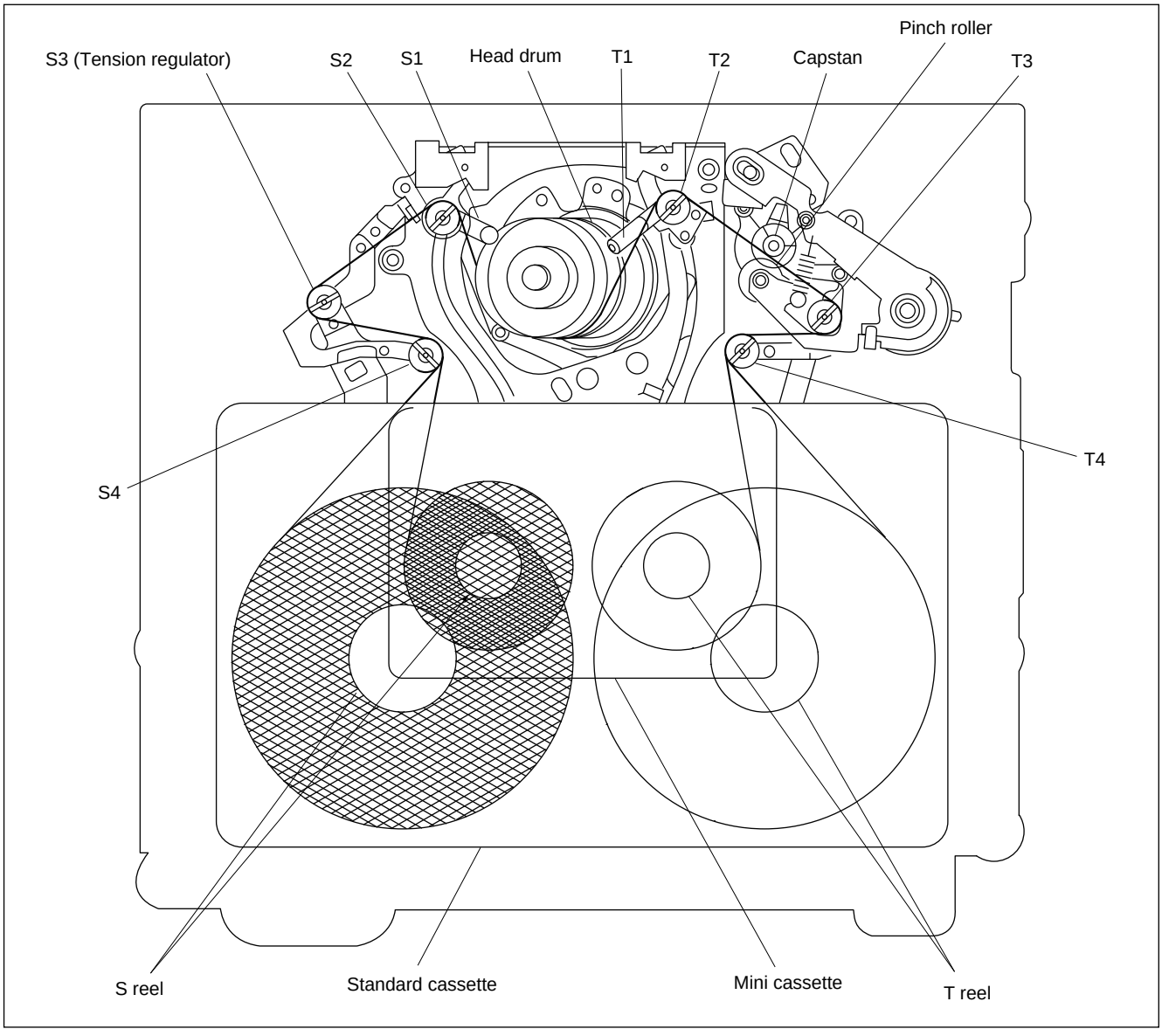
(5) Press the OUT (→) key to show the “START OK?” display.
(6) Press the SET key.



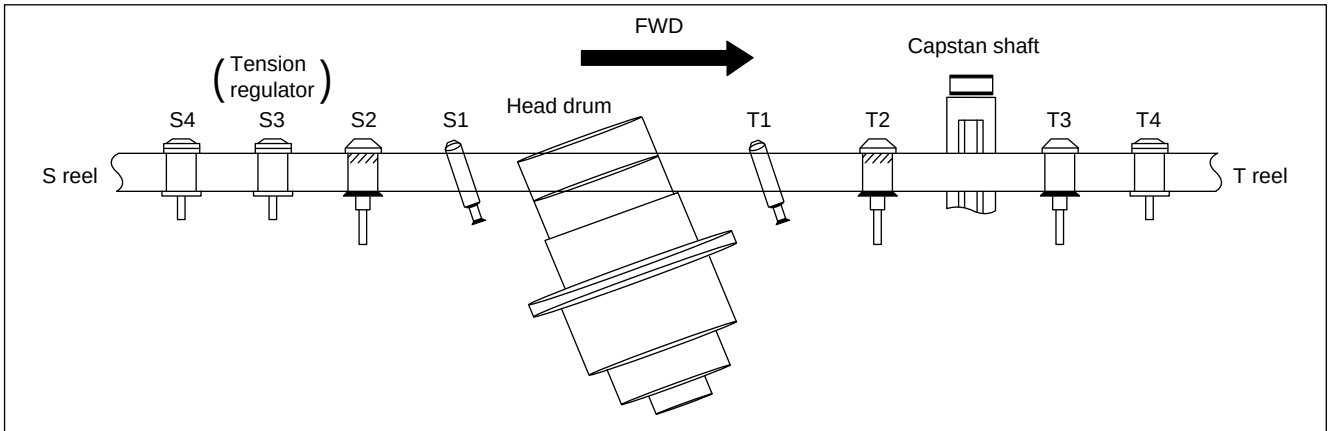
(7) Let the “TRACKING ADJUST” display appear on the screen. The adjustments that are described in sections 7-2, 7-4 to 7-9 are performed in this mode.

* This unit does not have the tracking shift function. Instead of having the tracking shift function, the tracking alignment tape XH2-1AST has already been recorded in the factory so that the servo is locked at 50 % off-track automatically.

8. Tape guide locations



9. Tape running condition



The hatched areas (marked by /////) are contacting with tape or pressing tape.

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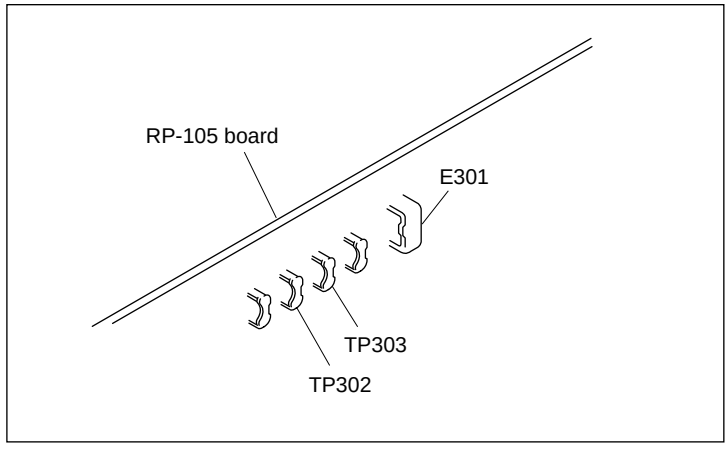
10. Measurement points and signals for adjustment

Signal Name	Board Name	TP terminal
RF (the signal after envelope detection)	RP-105	TP302
SW PULSE OUTPUT	RP-105	TP303
GND	RP-105	E301



7-2. TAPE PATH ADJUSTMENT

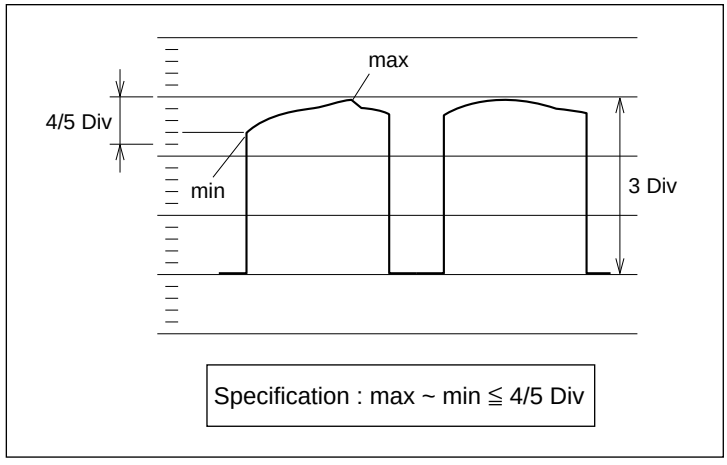
Required tools

Alignment tape, XH2-1AST : 8-967-999-02
Dual trace oscilloscope

* To perform the tracking adjustment using the tracking alignment tape (XH2-1AST), perform the following procedure.
  - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
  - For the procedure to exit the maintenance menu, refer to sections 4-2-3.
  - For the operating procedure of the maintenance menu for the tracking adjustment, refer to section 7-1.

Check procedure

1. Connect an oscilloscope as follows :
   CH-1 : TP302/RP-105 board
   CH-2 : TP303/RP-105 board
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Enter the PLAY mode.
4. Adjust the Variable VOLTS/DIV control of an oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs sharp on an oscilloscope.



5. Adjust the RF waveform until it satisfies the specification by changing the height of the S2 and T2 guides.
   - When the RF waveform at the entrance side forms the shape of the solid line given in Fig.-1, turn guide S2 clockwise to obtain the flat waveform.

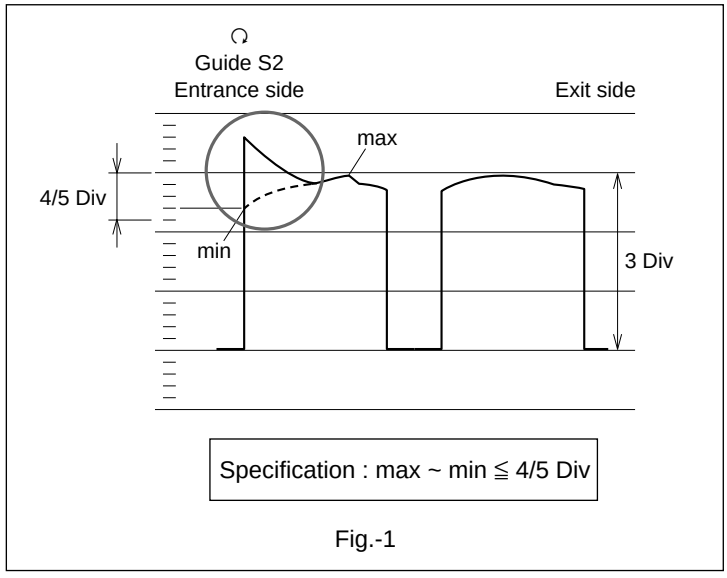


Fig.-1

- When the RF waveform at the entrance side forms the shape of the solid line given in Fig.-2, turn guide S2 counter-clockwise to obtain the flat waveform.

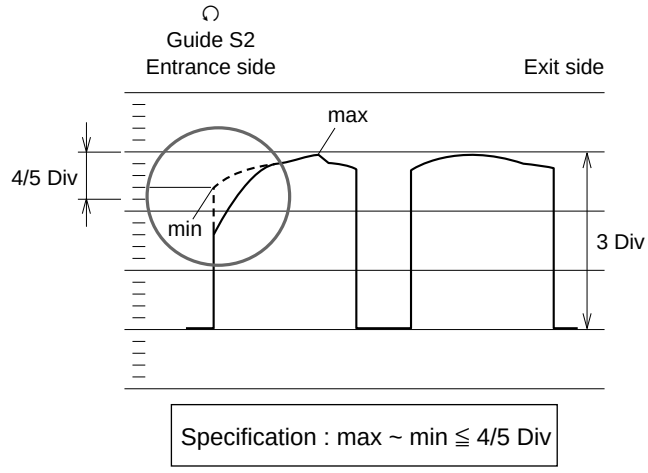


Fig.-2

- When the RF waveform at the exit side forms the shape of the solid line given in Fig.-3, turn guide T2 clockwise to obtain the flat waveform.

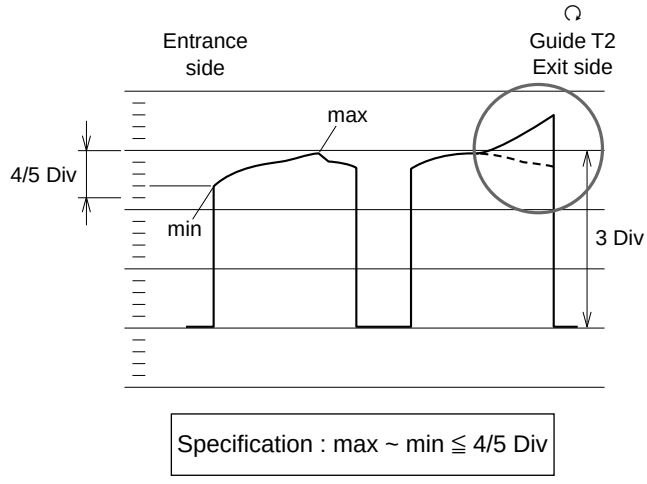


Fig.-3

- When the RF waveform at the exit side forms the shape of the solid line given in Fig.-4, turn guide T2 clockwise to obtain the flat waveform. the RF waveform satisfies the specification.

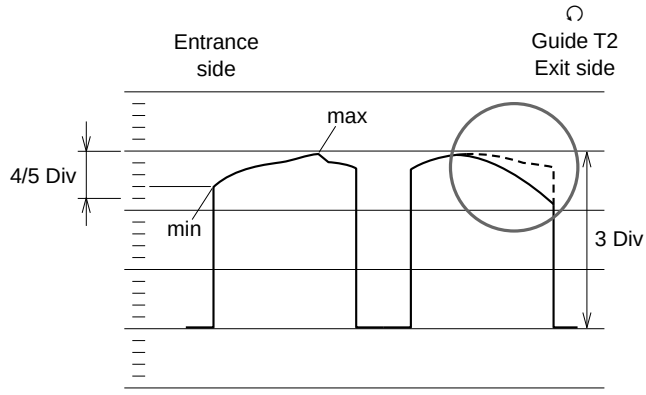
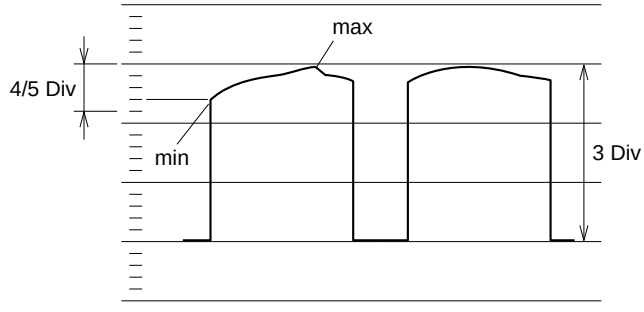


Fig.-4

6. Measure the minimum amplitude of the RF waveform and confirm that the amplitude difference between the maximum and the minimum portions of the RF waveform satisfies the specification.



7-3. RF SWITCHING POSITION ADJUSTMENT

Be sure to perform the RF switching position adjustment whenever the TAPE PATH ADJUSTMENT (refer to section 7-2) is performed.
Perform this adjustment in the AUTO mode.

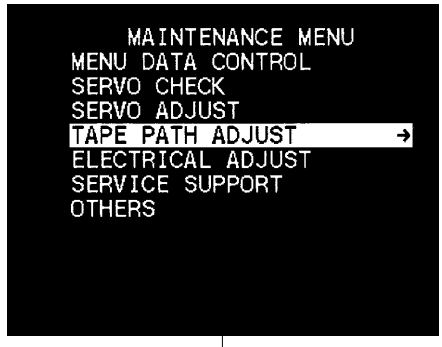
Tools

Alignment tape, XH5-1A : 8-967-999-21 (NTSC)
XH5-1AP : 8-967-999-25 (PAL)

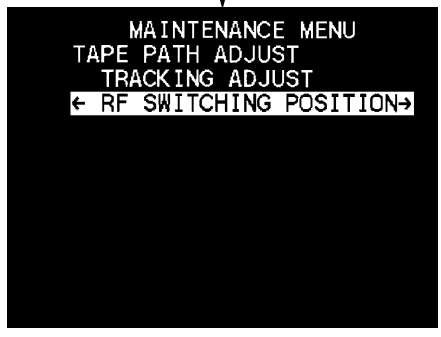
* To perform the RF switching adjustment using the alignment tape (XH5-1A for NTSC, or XH5-1AP for PAL), perform the following procedure.
  - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
  - For the procedure to exit the maintenance menu, refer to sections 4-2-3.

Operating procedure of the RF switching position adjustment using the [AUTO adjustment]

1. Enter the maintenance menu.
2. Move the cursor to “MENU DATA CONTROL” which is displayed with a white background, using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.
3. Press the [OUT] (→) key.
   “TAPE PATH ADJUST” is selected and its lower layer submenu appears.



4. Move the cursor to “RF SWITCHING POSITION” which is displayed with a white background, using the [ENTRY] (↑), [AUTO EDIT] (↓) keys.



5. Select “AUTO” by pressing the [AUTO EDIT] (↓) key.

6. Press the [OUT] key to show the display ① “START OK?”.
7. Press the [SET] key.

①

8. Playback the alignment tape XH5-1A for NTSC, or XH5-1AP for PAL. (display ②)
   Then the unit starts the RF switching position automatic adjustment. (display ③)

②

③

④

9. When the adjustment is complete, the display ⑤ "COMPLETE" appears.

   Note : When the display "ADJUST INCOMPLETE" appear on the monitor screen, check that the alignment which is played back is XH5-1A for NTSC, or XH5-1AP for PAL.

⑤

10. When the adjustment is complete, the alignment tape is automatically ejected.
11. Press the MENU key to return to the maintenance menu.

7-4. CONFIRMATION OF TAPE PATH ADJUSTMENT

Re-perform section 7-2, “TAPE PATH ADJUSTMENT” after performing section 7-2, “TAPE PATH ADJUSTMENT” and section 7-3, “RF SWITCHING POSITION ADJUSTMENT” continuously in that order.

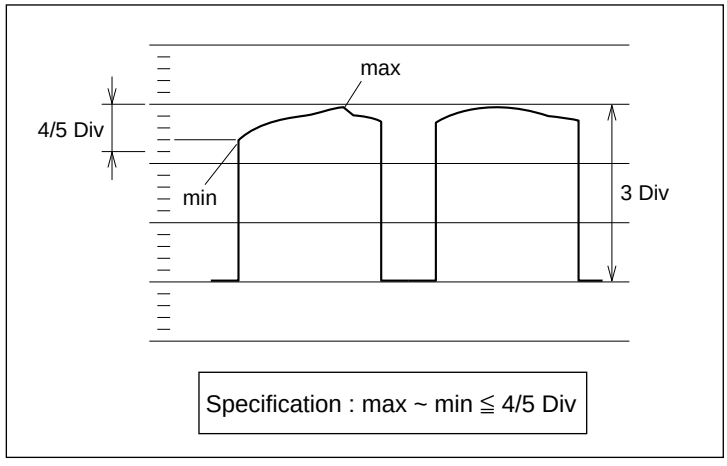
* To perform the tracking adjustment using the tracking alignment tape (XH2-1AST), perform the following procedure.
  - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
  - For the procedure to exit the maintenance menu, refer to sections 4-2-3.
  - For the operating procedure of the maintenance menu for the tracking adjustment, refer to section 7-1.

Required tools

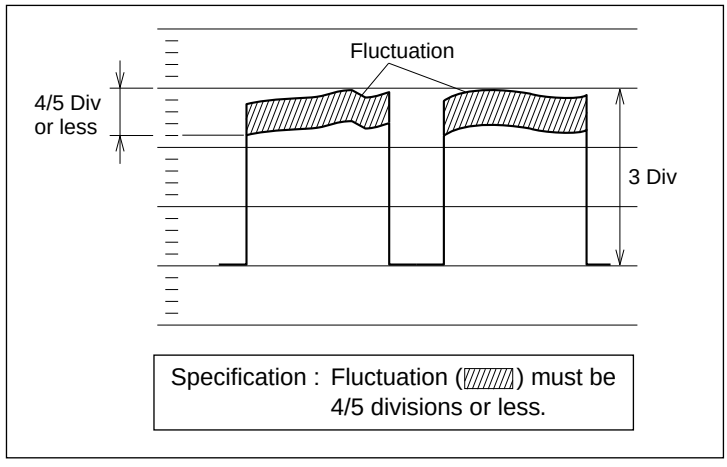
Alignment tape, XH2-1AST : 8-967-999-02
Dual trace oscilloscope

Check procedure

1. Connect an oscilloscope as follows :
   CH-1 : TP302/RP-105 board
   CH-2 : TP303/RP-105 board
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Enter the PLAY mode.
4. Measure the minimum amplitude of the RF waveform and confirm that the amplitude difference between the maximum and the minimum portions of the RF waveform satisfies the specification.



5. Confirm that fluctuation of the RF waveform satisfies the specification.



7-5. SEARCH FORWARD (×5) WAVEFORM CHECK

Required tools

Alignment tape, XH2-1AST : 8-967-999-02
Dual trace oscilloscope

* To perform the tracking adjustment using the tracking alignment tape (XH2-1AST), perform the following procedure.
  - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
  - For the procedure to exit the maintenance menu, refer to sections 4-2-3.
  - For the operating procedure of the maintenance menu for the tracking adjustment, refer to section 7-1.

Check procedure

1. Connect an oscilloscope as follows:
   CH-1 : TP302/RP-105 board
   CH-2 : TP303/RP-105 board
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Set the JOG dial search FORWARD to the ×5 position.
4. Adjust the Variable VOLTS/DIV control of an oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs sharp on an oscilloscope.
5. The RF waveform must have almost equal amplitude at constant interval as shown in Fig.-1.

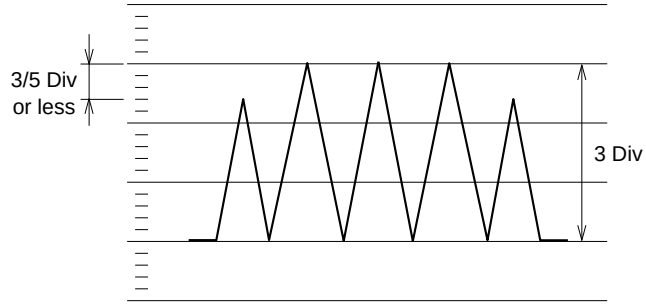
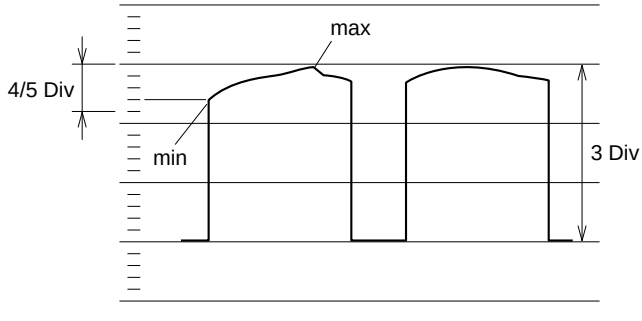


Fig.-1

6. Confirm that the RF waveform builds up within one second when the mode is changed from search FORWARD (×5) to PLAY.



Specification : max ~ min ≦ 4/5 Div

7-6. SEARCH REVERSE (×5) WAVEFORM CHECK

Required tools

Alignment tape, XH2-AST : 8-967-999-02
Dual trace oscilloscope

* To perform the tracking adjustment using the tracking alignment tape (XH2-1AST), perform the following procedure.
  - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
  - For the procedure to exit the maintenance menu, refer to sections 4-2-3.
  - For the operating procedure of the maintenance menu for the tracking adjustment, refer to section 7-1.

Check procedure

1. Connect an oscilloscope as follows:
   CH-1 : TP302/RP-105 board
   CH-2 : TP303/RP-105 board
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Set the JOG dial search reverse to the ×5 position.
4. Adjust the Variable VOLTS/DIV control of an oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs sharp on an oscilloscope.
5. The RF waveform must have almost equal amplitude at constant interval as shown in Fig.-1.

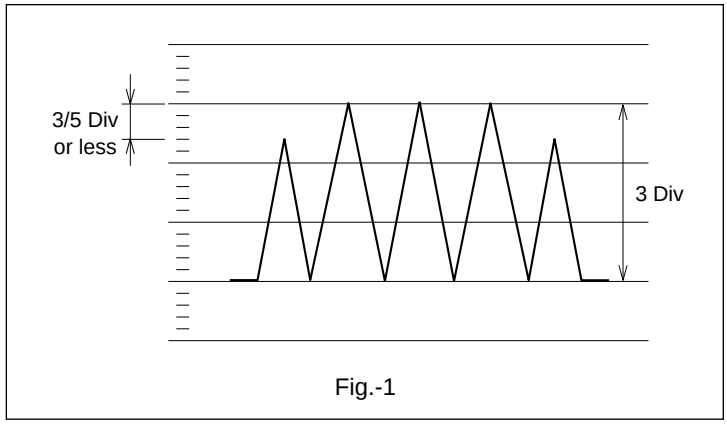
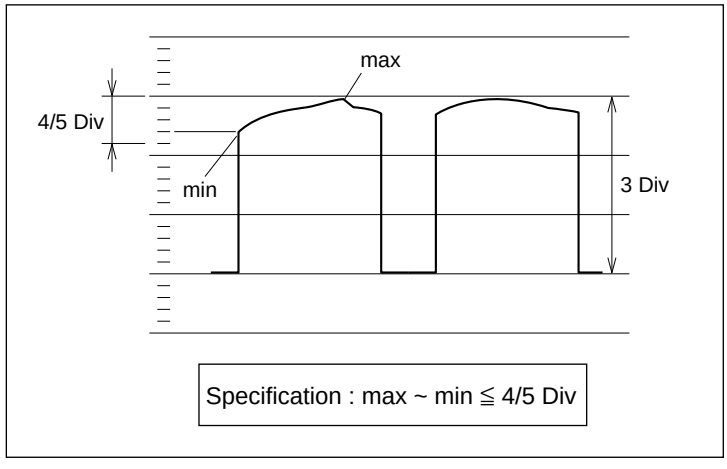


Fig.-1

6. Confirm that the RF waveform builds up within one second when the mode is changed from search REVERSE (×5) to PLAY.



http://getMANUAL.com

7-7. RF WAVEFORM BUILDUP CHECK

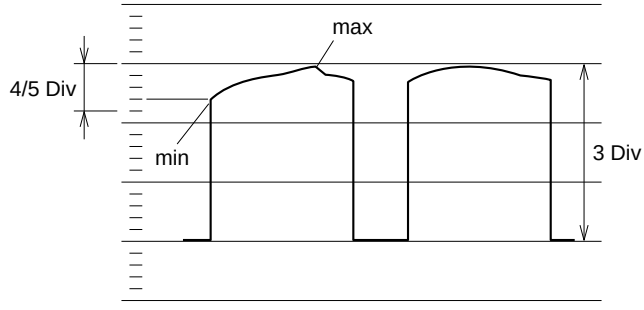
Required tools

Alignment tape, XH2-1AST : 8-967-999-02
Dual trace oscilloscope

* To perform the tracking adjustment using the tracking alignment tape (XH2-1AST), perform the following procedure.
  - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
  - For the procedure to exit the maintenance menu, refer to sections 4-2-3.
  - For the operating procedure of the maintenance menu for the tracking adjustment, refer to section 7-1.

Check procedure

1. Connect an oscilloscope as follows:
   CH-1 : TP302/RP-105 board
   CH-2 : TP303/RP-105 board
   TRIG : CH-2
2. Set the alignment cassette XH2-1AST (standard cassette) on the VTR and place a weight on a cassette so that a cassette is securely fixed in position.
3. Confirm that the RF waveform builds up within one second while satisfying the specification shown in Fig.-1 when the mode is changed from EJECT → PLAY → EJECT → PLAY repeatedly.
4. The RF waveform must build up within one second while satisfying the specification shown in Fig.-1 when the mode is changed from FF → PLAY and from REW → PLAY.



Specification : max ~ min ≦ 4/5 Div

Fig.-1

7-8. TAPE CURL CHECK AT TAPE GUIDES

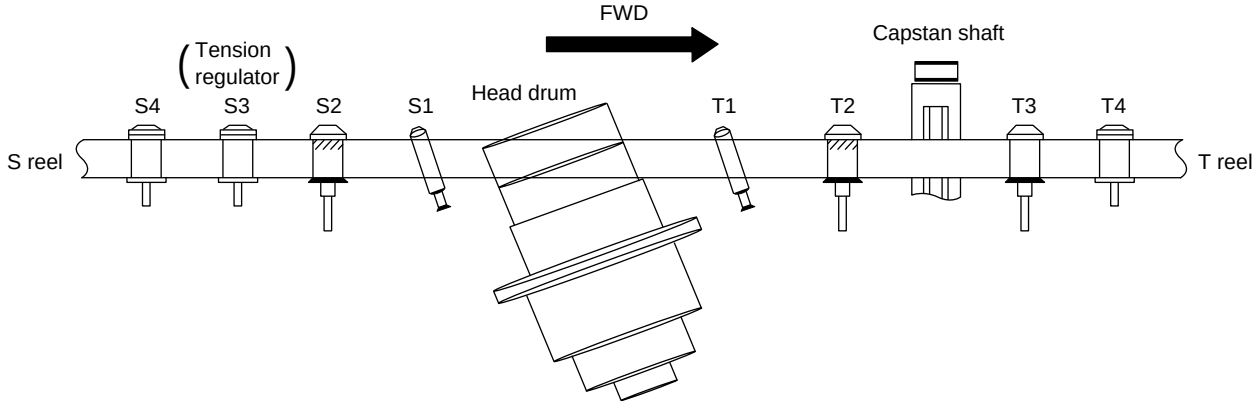
Required tools

Alignment tape, XH2-1AST : 8-967-999-02
Dental mirror : J-6080-029-A

Check procedure

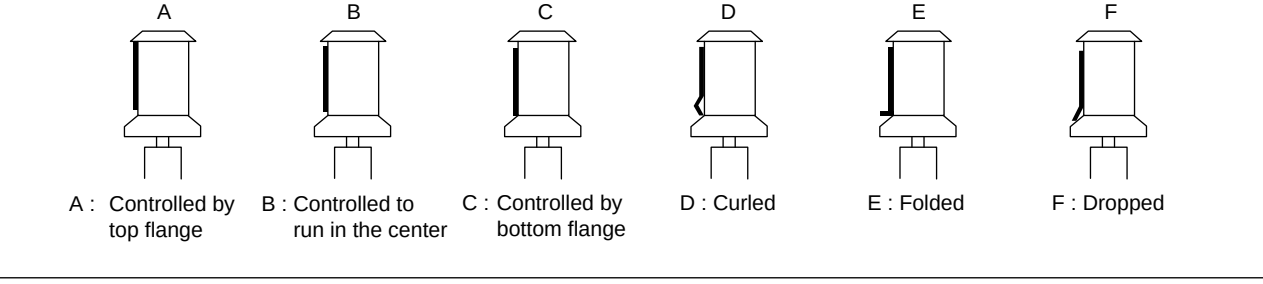
Confirm that tape running is controlled by each tape guide as specified by the following drawing when a tape is advanced in the modes of PLAY, FF, REW, search FORWARD ×5 and search REVERSE ×5 respectively.

Tape running condition



The hatched areas (marked by /////) are contacting with tape or pressing tape.

	Tape running control					
Tape guide	**A (Controlled top flange)**	**B (Controlled to run in the center)**	**C (Control by bottom flange)**	**D (Curled)**	**E (Folded)**	**F (Dropped)**
S4	○	○	○	×	×	×
S3	×	○	○	×	×	×
S2	○	×	×	×	×	×
T2	○	×	×	×	×	×
T3	○	○	○	×	×	×
T4	○	○	○	×	×	×



7-9. CHECK BY PLAYING BACK SELF-RECORDED TAPE

Required tools

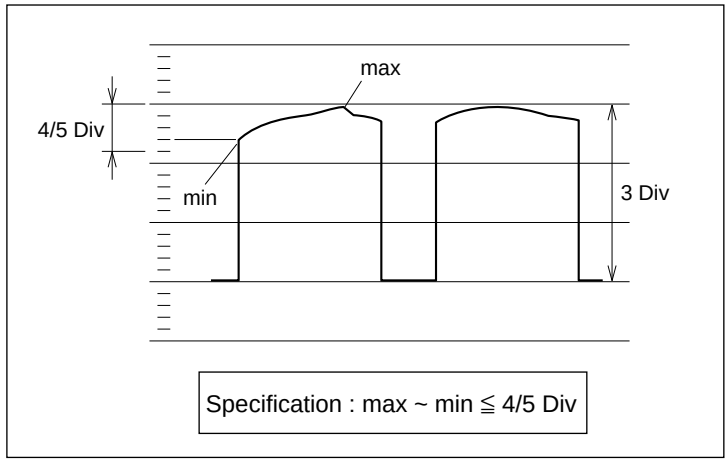
Dual trace oscilloscope
Blank tape
(Commercially available tape, SONY DVM30ME or equivalent)

Check procedure

1. Connect an oscilloscope as follows :
   CH-1 : TP302/RP-105 board (RF output)
   CH-2 : TP303/RP-105 board (SW PULSE output)
   TRIG : CH-2
2. Install a blank tape (one commercially available on the market, SONY DVM30ME, or equivalent), and give a weight on it.

* How to enter and exit the menu to perform recording and playback:
  - For the procedure to enter the maintenance menu, refer to sections 4-2-1 and 4-2-2.
  - For the procedure to exit the maintenance menu, refer to sections 4-2-3.

3. Record a blank tape for 30 seconds.
4. Play back the segment recorded by step 3.
5. Adjust the Variable VOLTS/DIV control of an oscilloscope so that the maximum amplitude of the RF waveform becomes the three DIVISIONs sharp on an oscilloscope.
6. Measure the minimum amplitude of the RF waveform and confirm that the amplitude difference between the maximum and the minimum portions of the RF waveform satisfies the specification.



SECTION 8
ELECTRICAL ALIGNMENT (for NTSC)

8-1. ELECTRICAL ALIGNMENT OVERVIEW (for NTSC)

8-1-1. List of Adjustment Parts

AU-259

RV101 CH-1 EE Level ..... 8-4 (N)
RV201 CH-2 EE Level ..... 8-4 (N)
RV301 CH-1/3 PB Level ..... 8-4 (N)
RV302 CH-2/4 PB Level ..... 8-4 (N)
RV501 AGC Level ..... 8-4 (N)

DDE-13

CT500 SPCK Error ..... 8-21 (N)
RV100 REC A/D Y Level ..... 8-26 (N)
RV102 REC S VIDEO Chroma Level ..... 8-28 (N)
RV200 REC Composite Y Level ..... 8-27 (N)
RV201 REC Composite Chroma Level ..... 8-28 (N)
RV202 REC Composite Chroma Level ..... 8-28 (N)
RV300 Composite 4Fsc PLL DC ..... 8-22 (N)
RV400 REC Y Level ..... 8-24 (N)
RV401 REC Component B-Y Level ..... 8-25 (N)
RV402 REC Component R-Y Level ..... 8-25 (N)
RV403 REC Y Clamp Level ..... 8-23 (N)
RV404 REC Composite Y/B-Y Delay ..... 8-29 (N)
RV405 REC S VIDEO Y/B-Y Delay ..... 8-31 (N)
RV406 REC Component Y/B-Y Delay ..... 8-30 (N)
RV407 REC Composite Y/R-Y Delay ..... 8-29 (N)
RV408 REC S VIDEO Y/R-Y Delay ..... 8-31 (N)
RV409 REC Component Y/R-Y Delay ..... 8-30 (N)

DEN-11

RV101 PB Composite Y/C Delay ..... 8-15 (N)
RV102 PB Composite C/C Delay ..... 8-14 (N)
RV200 ENC R-Y Level ..... 8-13 (N)
RV201 ENC B-Y Level ..... 8-13 (N)
RV202 ENC V SC Leak ..... 8-11 (N)
RV203 ENC U SC Leak ..... 8-11 (N)
RV204 PB Burst Level ..... 8-13 (N)
RV300 COMPONENT Y OUT Level ..... 8-7 (N)
RV301 COMPONENT B-Y OUT Level ..... 8-7 (N)
RV302 COMPONENT R-Y OUT Level ..... 8-8 (N)
RV303 PB S VIDEO Chroma Level ..... 8-14 (N)
RV304 VIDEO OUT 1 Y Level ..... 8-9 (N)
RV305 VIDEO OUT 2 Y Level ..... 8-10 (N)
RV306 VIDEO OUT 1 Sync Level ..... 8-9 (N)
RV307 COMPONENT Y Sync Level ..... 8-7 (N)
RV308 PB Component Y/B-Y Delay ..... 8-16 (N)
RV309 PB Component Y/R-Y Delay ..... 8-16 (N)

DEN-12

RV100 Sync Phase ..... 8-32 (N), 8-33 (N)
RV101 SC Phase ..... 8-34 (N)
RV102 PB INT SCH Phase ..... 8-17 (N)
RV103 REF. CF Phase ..... 8-18 (N)
RV104 ENC V (R-Y) Phase ..... 8-12 (N)
RV105 ENC U (B-Y) Phase ..... 8-12 (N)
RV106 REF. VIDEO OUT Sync Level ..... 8-20 (N)
RV107 REF. VIDEO OUT Burst Level ..... 8-20 (N)
RV108 REF. INT SCH Phase ..... 8-20 (N)
RV200 INT SC Frequency ..... 8-6 (N)

SDI-38

RV101 Free Run ..... 8-35 (N)
RV601 Free Run ..... 8-35 (N)

SDI-39

RV101 Free Run ..... 8-35 (N)
RV501 Free Run ..... 8-35 (N)

SY-269

CV101 Character Position ..... 8-3 (N)

8-1-2. Measuring Equipment and Tools

Type of measuring equipment	Equivalent	Remarks
Oscilloscope	Tektronix 2445	150 MHz or more
Video signal generator	TSG-130A (Op.02)	
Waveform monitor	Tektronix 1760 Op. SC/1765 Op. SC	
Audio signal generator	HP339A	
Audio level meter	HP3400A/MeguroMN-446	
Frequency counter	Advantest TR5821	
Extension board	DJ-352 (J-6443-520-A)	
Analog component I/O board	DSBK-170	
Blank tape	DVM30ME, DVM30NME	On the market

8-1-3. Reference Tape for Alignment

XH5-1A2 (8-967-999-22)
Recording contents are followings.

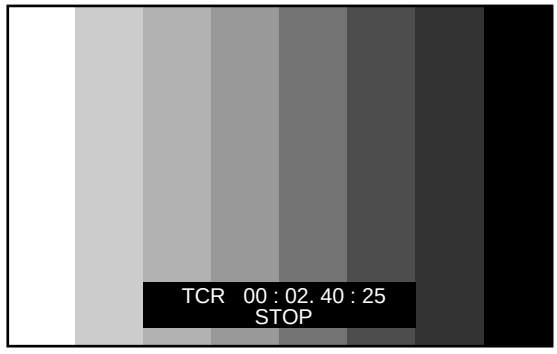
VIDEO	TIME CODE (h) (m) (s)	REC (s)	AUDIO		
Black Burst	23 : 59 : 00	60	No Signal		32 kHz 4 ch
75 % Full Color Bars	00 : 00	60	1 kHz		
60 % Multi Burst	01 : 00	60	20 Hz		
Bowtie with Mod 12.5T	02 : 00	30	14.5 kHz		
Shallow Ramp	02 : 30	30	10 kHz		
	03 : 00	30	No Signal		
Cross Hatch (index)	03 : 30	30	1 kHz 0 dBFS		
Line 17	04 : 00	40	1 ch	1 kHz	
75 % Full Color Bars	04 : 40	40	2 ch		
Quad Phase	05 : 20	40	3 ch		
	06 : 00	40	4 ch		
Black Burst	06 : 40	5	No Signal		
	06 : 45	5			48 kHz 2 ch
60 % Multi Burst (for Composite)	06 : 50	60	1 kHz		
Mod 12.5T	07 : 50	30	20 Hz		
Shallow Ramp (B-Y/R-Y OFF)	08 : 20	30	20 kHz		
	08 : 50	30	10 kHz		
Cross Hatch (index)	09 : 20	30	1 kHz 0 dBFS		
Chroma Noise	09 : 50	30	1 kHz		
Line 17	10 : 20	30			
75 % Full Color Bars	10 : 50	180			
60 % Multi Burst	13 : 50	60			
Mod 12.5T	14 : 50	30			
Shallow Ramp	15 : 20	60			
75 % Full Color Bars	16 : 20	100			
75 % Full Color Bars (R-Y OFF)	18 : 00	180			
75 % Full Color Bars (B-Y OFF)	21 : 00	180			
Blanking Marker	24 : 00	180			
Line 17 (R-Y OFF)	27 : 00	180			
Line 17 (B-Y OFF)	30 : 00	180			

* **Audio levels are –20 dBFS (Reference), except 1 kHz 0 dBFS part.**

8-2. ADJUSTMENT PROCEDURE (for NTSC)

8-2-1. System / Audio Adjustment

8-2-1-1. Character Position Adjustment

Conditions for adjustment	Adjustment • Specification
• CHARACTER : ON • EE mode • VIDEO IN : 75 % Color bars	VIDEO 2 (SUPER) OUT (75 Ω terminated) ⊘**CV101**/SY-269 (F-3)  **Spec. Adjust the character position with a good balance with respect to color bars.**

8-2-1-2. Audio PB Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ENHANCED ↓ AU REF LEVEL ; –20 dB OUTPUT LEVEL ; +4 dB • AUDIO INPUT & PB AUDIO SW/Control panel ; PRESET • PB mode 1 kHz Ref. level (32 kHz, 4CH) / XH5-1A2 (03:30-04:00)	AUDIO OUPUT 1/3 & 2/4 (600 Ω loaded) CH-1/3 ; ⊘**RV301**/AU-259 (D-3) CH-2/4 ; ⊘**RV302**/AU-259 (C-3) **Spec. +4.0 ±0.3 dBu**

8-2-1-3. Audio EE Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ENHANCED ↓ AU REF LEVEL ; –20 dB OUTPUT LEVEL ; +4 dB • AUDIO INPUT & PB AUDIO SW/Control panel ; PRESET • AUDIO INPUT CH-1/CH-2 ; 1 kHz, +4 dBu • EE mode	AUDIO OUTPUT 1/3 & 2/4 (600 Ω loaded) CH-1 ; ⊘**RV101**/AU-259 (F-2) CH-2 ; ⊘**RV201**/AU-259 (E-2) **Spec. +4.0 ±0.5 dBu**

8-2-1-4. Audio AGC Adjustment

Conditions for adjustment	Adjustment • Specification
• CH-1, 2 AGC/SUB LCD MENU ; AGC ON • AUDIO INPUT & PB AUDIO SW/Control panel ; PRESET • AUDIO INPUT switch CH-1, 2/Rear panel ; –60 dBu • AUDIO INPUT CH-1/CH-2 ; 1 kHz, –20 dBu • EE mode * Reset the setup after adjustment is completed.	AUDIO OUTPUT 1/3 & 2/4 (600 Ω loaded) CH-1/CH-2 common specifications ⊘**RV501**/AU-259 (F-3) **Spec. +9.0 ±0.3 dBu**

8-2-2. Video Adjustment

[Switch Setting]

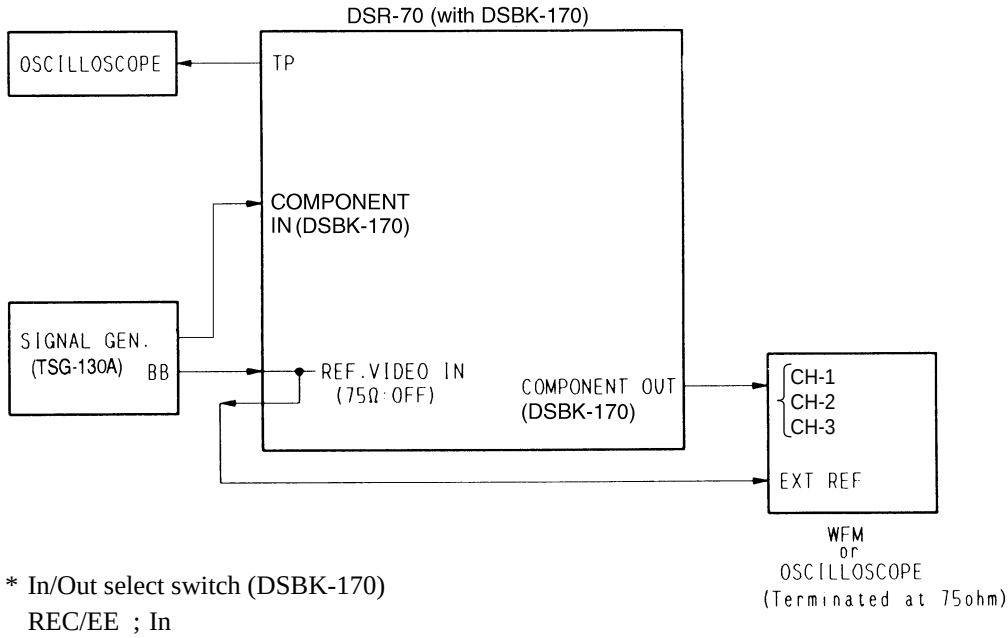
This setting should be fixed in position unless otherwise specified.

LOCAL/REMOTE ; LOCAL
CHARACTER ; ON
MENU ITEM 713-1, INPUT LEVEL ; 0.0 %
MENU ITEM 713-2, OUTPUT LEVEL ; 0.0 %

[Connection]

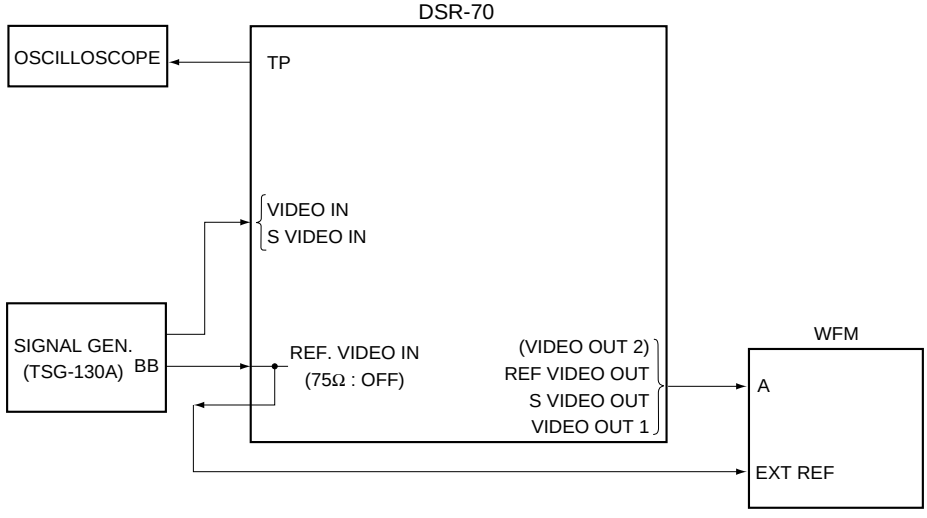
Connect some equipment as following unless otherwise specified.

(Connection 1)



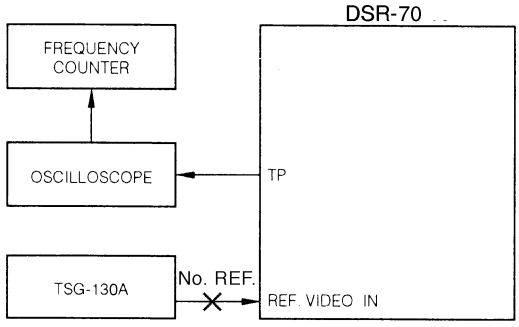
* In/Out select switch (DSBK-170)
REC/EE ; In
PB ; Out

(Connection 2)



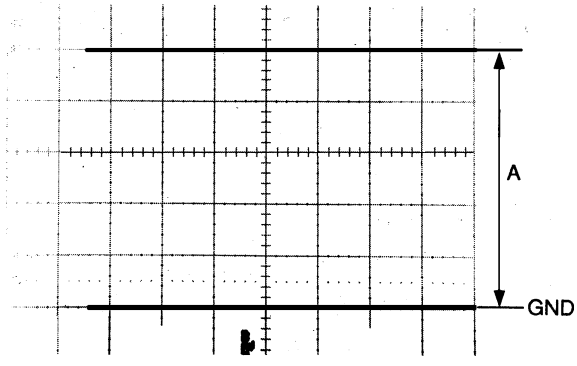
8-2-2-1. INT SC Frequency Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• STOP mode • REF. VIDEO IN ; No signal	TP200/DEN-12 (*D-3) ⊘**RV200**/DEN-12 (*D-2) Frequency counter **Spec. f=3,579,545 ±10 Hz**

8-2-2-2. HCK Check

Conditions for adjustment	Adjustment • Specification
• STOP mode Connection 1 or 2	TP201/DEN-12 (*D-2) Oscilloscope  **Spec. A=2.5 ±0.5 Vdc**

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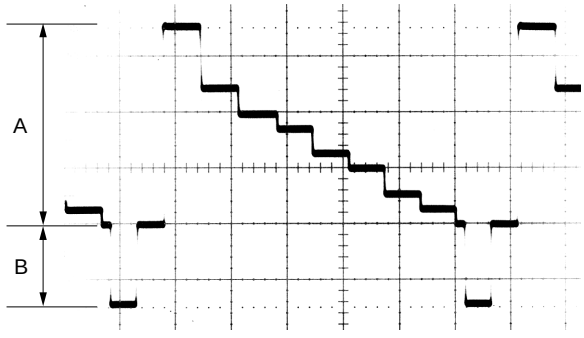
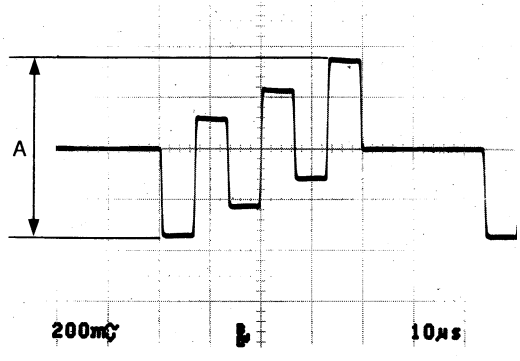
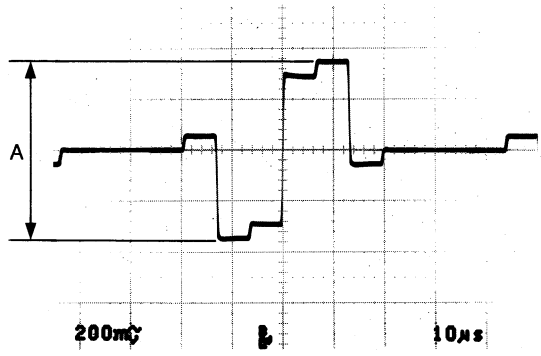
8-2-2-3. COMPONENT Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ITEM 713-2, OUTPUT LEVEL ; 7.5 % • PB mode 75 % Color bars/XH5-1A2 Connection 1	COMPONENT Y OUT (75 Ω terminated) (A) Y/S-Y Level ⊘**RV300**/DEN-11 (*E-1) (B) Y/S-Y SYNC ⊘**RV307**/DEN-11 (*F-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)** **B=0.286 ±0.003 V (40 ±0.5 IRE)**

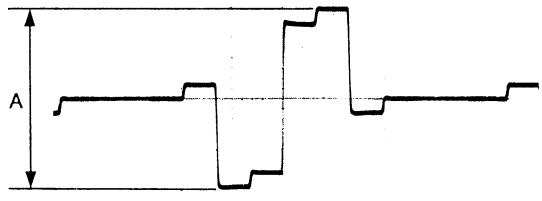
8-2-2-4. COMPONENT B-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ITEM 713-2, OUTPUT LEVEL ; 7.5 % • PB mode 75 % Color bars/XH5-1A2 Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ⊘**RV301**/DEN-11 (*F-2) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

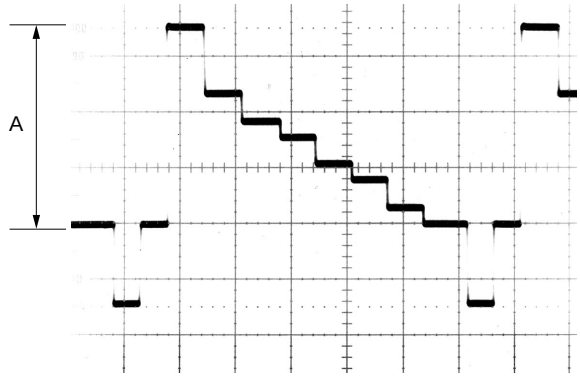
8-2-2-5. COMPONENT R-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ITEM 713-2, OUTPUT LEVEL ; 7.5 % • PB mode 75 % Color bars/XH5-1A2 Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ⊘**RV302**/DEN-11 (*F-2) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

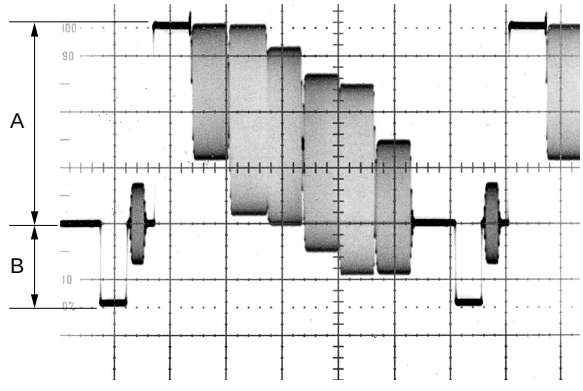
8-2-2-6. Setup off Chroma Level Check

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 **Note : Check that MENU ITEM 713-2, OUTPUT LEVEL ; 0.0 %** Connection 1	COMPONENT R-Y OUT (75 Ω terminated) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.757 ±0.007 V (106 ±1 IRE)**

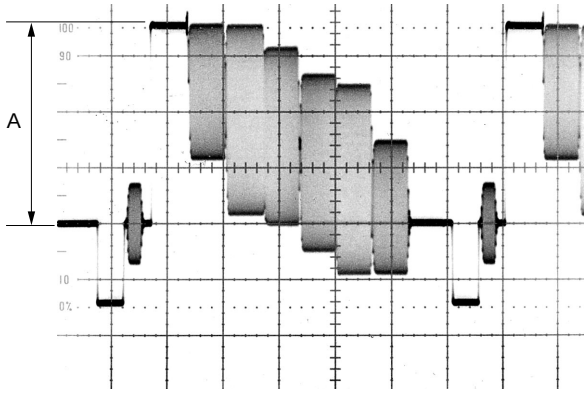
8-2-2-7. S VIDEO OUT Y Level Check

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	S VIDEO (Y) OUT (75 Ω terminated) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)**

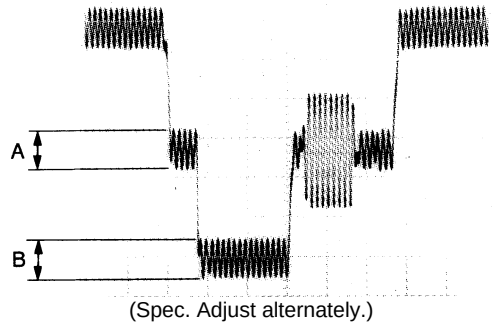
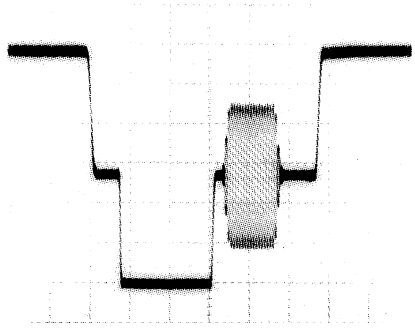
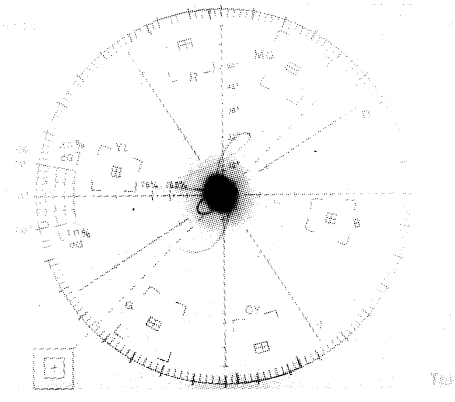
8-2-2-8. VIDEO OUT 1 Y/SYNC Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Video Level ⊘**RV304**/DEN-11 (*F-4) (B) Sync Level ⊘**RV306**/DEN-11 (*F-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)** **B=0.286 ±0.003 V (40 ±0.5 IRE)**

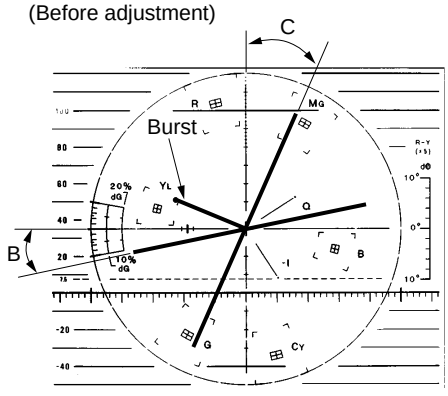
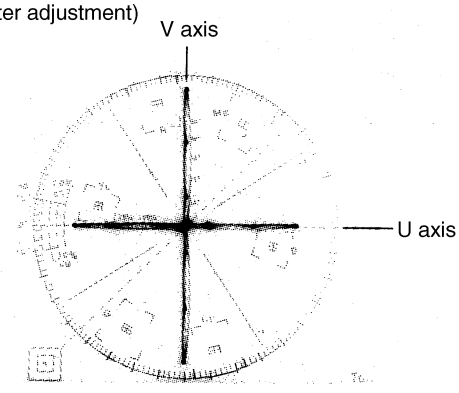
8-2-2-9. VIDEO OUT 2 Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	VIDEO OUT 2 (75 Ω terminated) ◓**RV305**/DEN-11 (*F-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)**

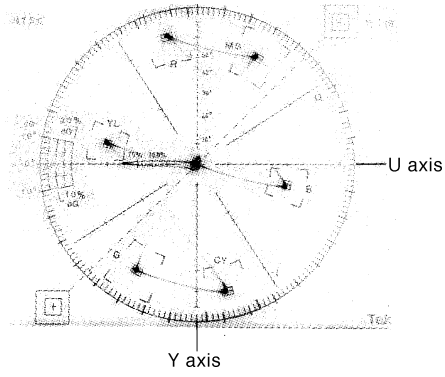
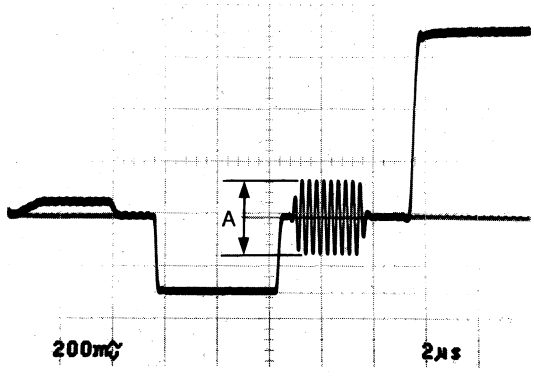
8-2-2-10. ENC SC Leak Adjustment

Conditions for adjustment	Adjustment • Specification
Step 1 • PB mode 75 % Color bars/XH5-1A2 • Set the time axis of the WFM to magnification mode Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) V SC Leak ⊘**RV202**/DEN-11 (E-1) (B) U SC Leak ⊘**RV203**/DEN-11 (E-1) TRIG : REF. VIDEO WFM Before adjustment  (Spec. Adjust alternately.) ⇩ After adjustment  **Spec. Minimize the A, B. A, B≦0.007 V (1 IRE)**
Step 2 (Check) • PB mode 75 % Color bars/XH5-1A2 Connection 2	VIDEO OUT 1 (75 Ω terminated) TRIG : REF. VIDEO Vector  **Spec. Maximum the gain of the Vector and check the dot is at center.**

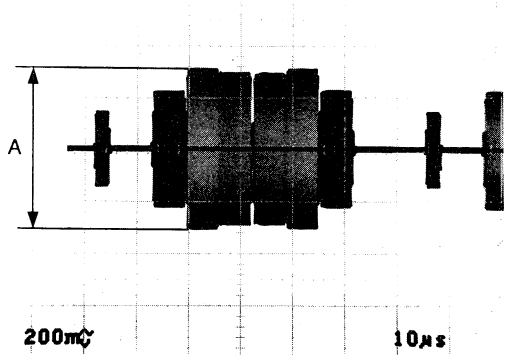
8-2-2-11. U-V Axis (B-Y, R-Y) Phase Adjustment

Conditions for adjustment	Adjustment • Specification
[Flow] (A) Burst preset • PB mode Quad Phase/XH5-1A2 (05:20-06:00) (B) U-axis phase adjustment • PB mode Quad Phase/XH5-1A2 (05:20-06:00) (C) V-axis phase adjustment • PB mode Quad Phase/XH5-1A2 (05:20-06:00) Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst preset ⊘**PHASE control**/Vector (B) U-axis (HUE) ⊘**RV105**/DEN-12 (C-1) (C) V-axis (U/V OFFSET) ⊘**RV104**/DEN-12 (C-1) TRIG : REF. VIDEO Vector (Before adjustment)  (After adjustment)  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) Set the dots of the B-Y on the U axis of the vector.** **(C) Set the dots of the R-Y on the V axis of the vector.** **B, C=0 ±0.5 °**

8-2-2-12. PB VIDEO OUT 1 Chroma/Burst Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 **Note : The "Setup ON/OFF" setting of the DSR-70 and that a vectorscope must have been set to the same position beforehand.**	VIDEO OUT 1 (75 Ω terminated) Step 1 C level (A) Burst ⊘**PHASE control**/Vector (B) ENC R-Y Level ⊘**RV200**/DEN-11 (E-1) ENC B-Y Level ⊘**RV201**/DEN-11 (D-1) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector by adjustment RV200 and RV201 alternately.**
	Step 2 Burst level ⊘**RV-204**/DEN-11 (D-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.286 ±0.003 V (40 ±0.5 IRE)**
Connection 2	

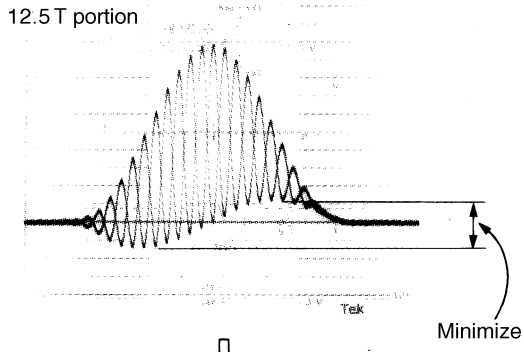
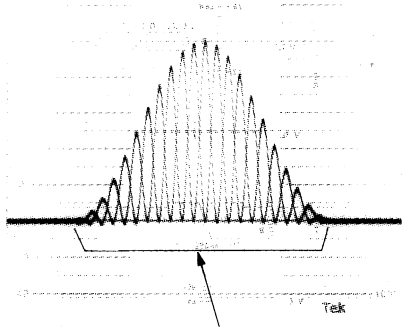
8-2-2-13. PB S VIDEO Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ITEM 713-2, OUTPUT LEVEL ; 7.5 % • PB mode 75 % Color bars/XH5-1A2 Connection 2	S VIDEO (C) OUT (75 Ω terminated) ⊘**RV303**/DEN-11 (*E-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.627 ±0.007 V (87.7 ±1 IRE)**

8-2-2-14. PB Composite C/C Delay Adjustment

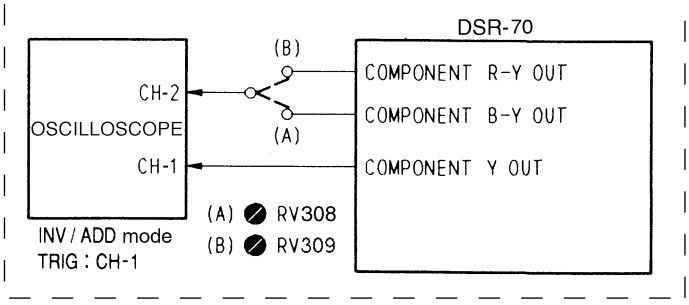
Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1A2 (02:00-02:30) Connection 2	CH-1/Oscilloscope TP101/DEN-11 (*D-3) ⊘**RV102**/DEN-11 (C-1) CH-2/Oscilloscope TP102/DEN-11 (*D-2) Oscilloscope Vertical mode : INV +ADD **Spec.** Minimize

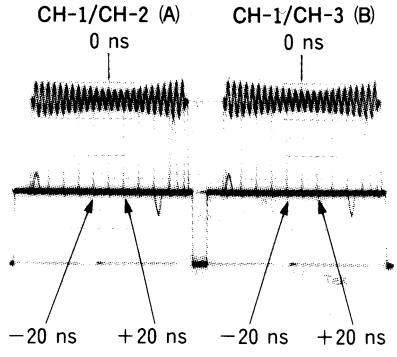
8-2-2-15. PB Composite Y/C Delay Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode Mod 12.5T/XH5-1A2 (07:50-08:20) Connection 2	VIDEO OUT 1 (75 Ω terminated) ⊘**RV101**/DEN-11 (C-1) TRIG : INT/WFM WFM Before adjustment 12.5 T portion  Minimize ⇩ After adjustment  **Spec.** Flat

8-2-2-16. PB Component Y/C Delay Adjustment

[Connection for reference] Using for an oscilloscope



Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1A2 (02:00-02:30) Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV308**/DEN-11 (*E-3) (B) R-Y Delay **RV309**/DEN-11 (*E-3) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

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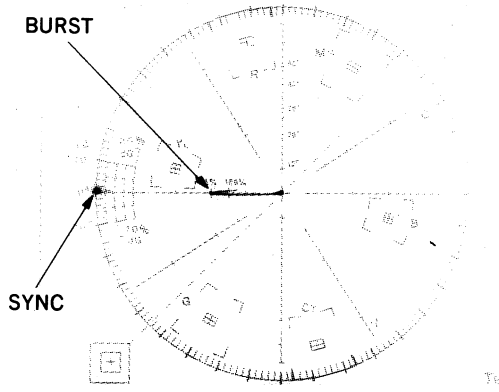
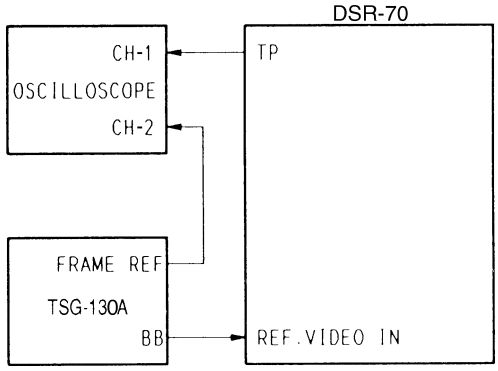
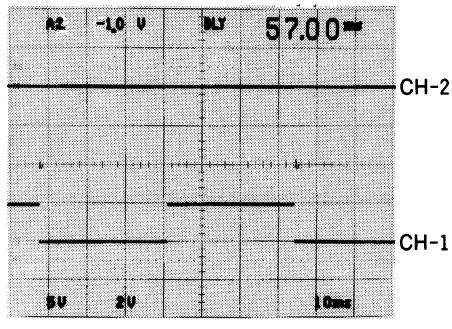
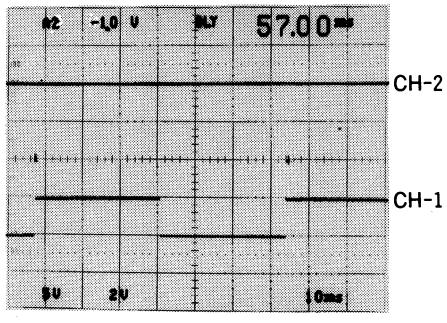
8-2-2-17. PB INT SCH Phase Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 • REF. VIDEO IN ; No signal • After adjustment, connect REF. VIDEO IN. Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst Preset ⊘**PHASE control**/Vector (B) INT SC ⊘**RV102**/DEN-12 (C-1) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the same phase as the burst (SCH=0 °).**

8-2-2-18. REF. CF Phase Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EJECT mode	CH-1/Oscilloscope TP203/DEN-12 (D-2) ⊘**RV103**/DEN-12 (S-1) CH-2/Oscilloscope FRAME PULSE/TSG-130A TRIG : FRAME PULSE (CH-2) Oscilloscope (NG)  CH-2 CH-1 ⇩ (OK)  CH-2 CH-1

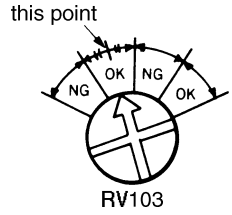
Spec. **(1) Turn RV103 counterclockwise fully.**

(2) When RV103 is turned clockwise gradually, the phase condition between CH-1 and CH-2 changes from NG to OK or OK to NG.

(3) In case of the pattern of change is started from NG as shown in the following illustration, set RV103 to mechanical center of range of first OK.

NG → OK → NG → OK

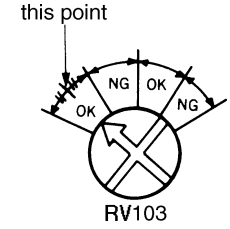
the mechanical center of this range



(4) In case of the pattern of change is started from OK as shown in the following illustration, set RV103 to mechanical center of range of first OK.

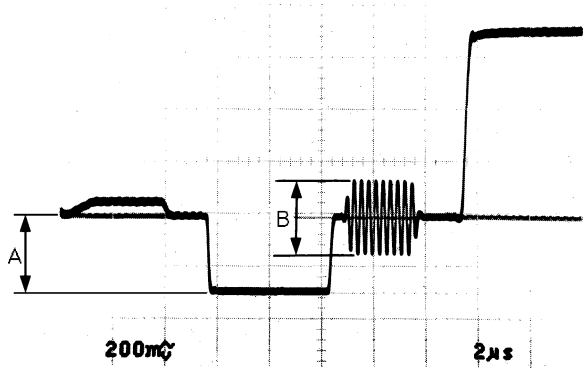
OK → NG → OK → NG

the mechanical center of this range

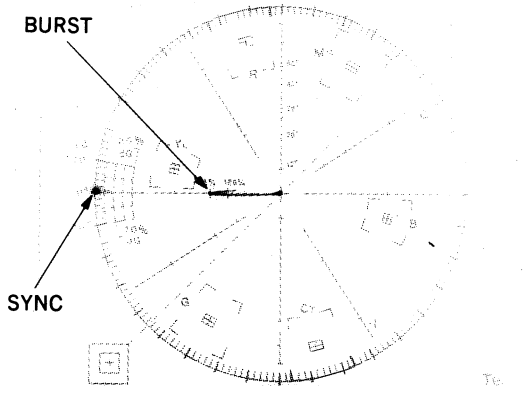


*** If the range of first OK is extremely narrow, set to mechanical center of range of second OK.**

8-2-2-19. REF. VIDEO OUT Sync/Burst Level Adjustment

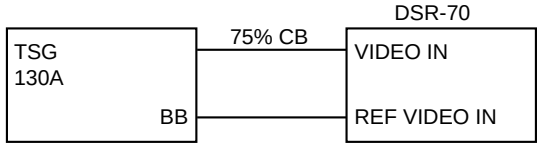
Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Sync Level ⊘**RV106**/DEN-12 (*E-3) (B) Burst Level ⊘**RV107**/DEN-12 (*E-3) TRIG : INT/WFM WFM or Oscilloscope  **Spec. A, B=0.286 ±0.003 V (40 ±0.5 IRE)**

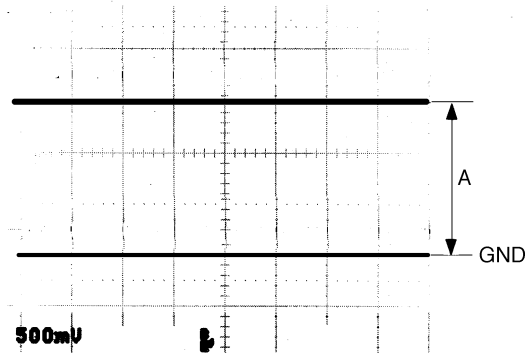
8-2-2-20. REF. Internal SCH Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 75 % Color bars/XH5-1A2 • REF. VIDEO IN ; No signal • After adjustment is completed, re-connect the REF. VIDEO IN. Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Burst Preset ⊘**PHASE control**/Vector (B) Sync Phase ⊘**RV108**/DEN-12 (*E-3) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the same phase as the burst.** **(SCH=0 ±3 °)**

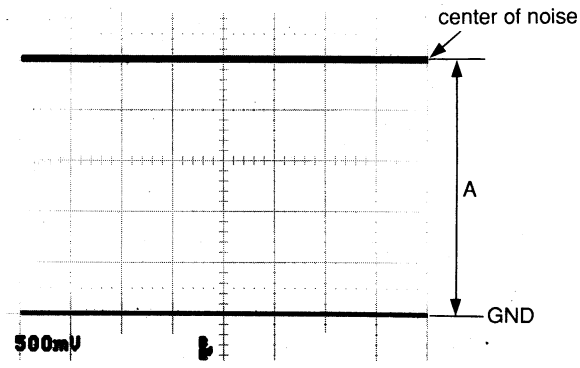
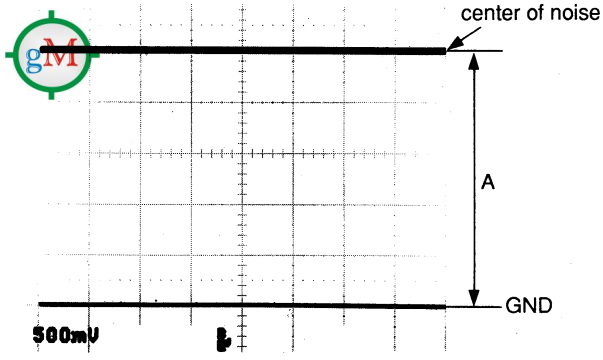
8-2-2-21. SPCK Error Adjustment

(Connection)

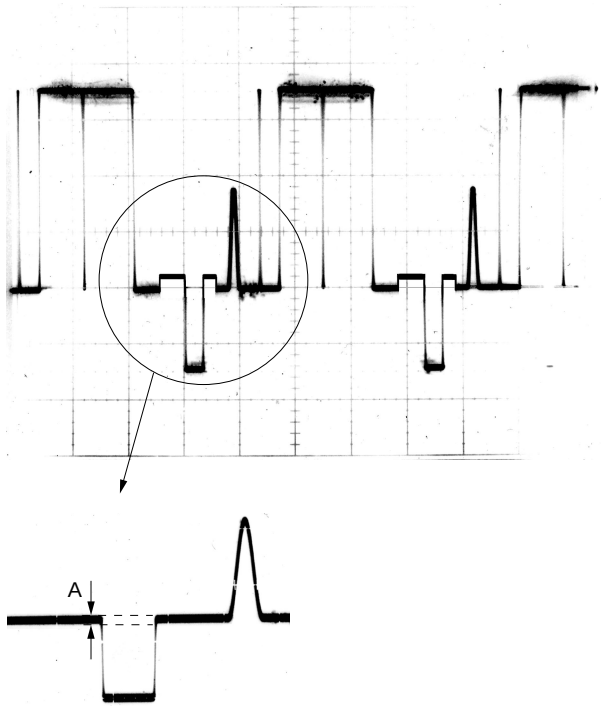


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars	TP500/DDE-13 (*G-4) ⊘**CT500**/DDE-13 (*G-4) Oscilloscope  **Spec. A=1.5 ±0.1 Vdc**

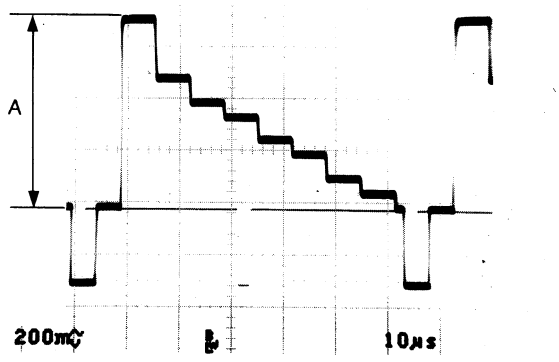
8-2-2-22. Composite 4Fsc PLL DC Check/Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/MENU ; COMPOSITE	TP301/DDE-13 (*B-5) [Check] Oscilloscope  **Spec. A=2.5 ±0.5 Vdc**
	TP300/DDE-13 (*A-4) ⊘**RV300**/DDE-13 (*B-5) Oscilloscope  **Spec. A=2.5 ±0.5 Vdc**
Connection 2	

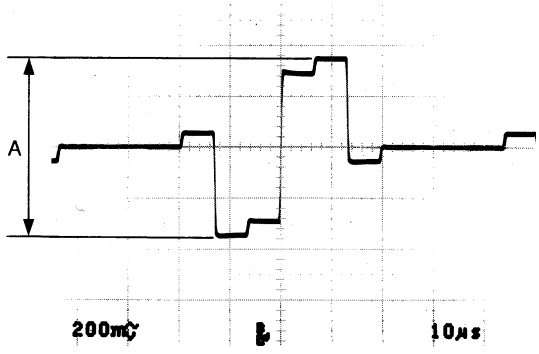
8-2-2-23. REC Y Clamp Level Adjustment

Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; Pluse & Bar **Note : Check that MENU ITEM 713-1, INPUT LEVEL ; 0.0 %** Connection 1	COMPONENT Y OUT (75 Ω terminated) ⊘**RV403**/DDE-13 (*E-4) WFM or Oscilloscope  **Spec. A=Minimize the level difference A at setup.**

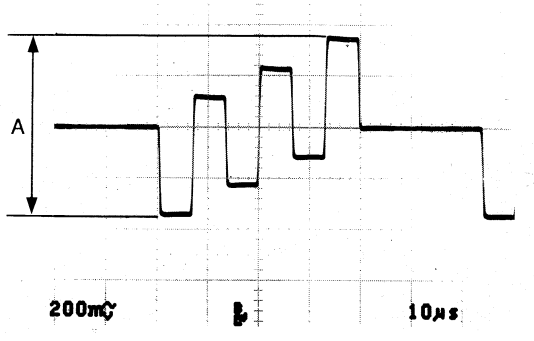
8-2-2-24. REC Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; 75 % Color bars Connection 1	COMPONENT Y OUT (75 Ω terminated) ⊘**RV400**/DDE-13 (*E-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.714 ±0.007 V (100 ±1 IRE)**

8-2-2-25. REC Component R-Y Level Adjustment

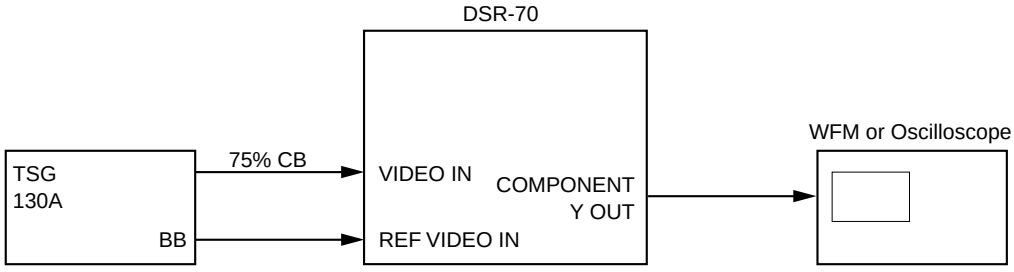
Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; 75 % Color bars Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ⊘**RV402**/DDE-13 (*D-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

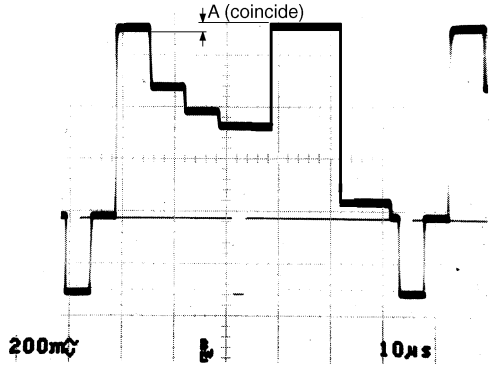
8-2-2-26. REC Component B-Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; 75 % Color bars Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ⊘**RV401**/DDE-13 (*D-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V (98 ±1 IRE)**

8-2-2-27. REC A/D Y Level Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/MENU ; COMPOSITE • S101-1/SV-203 (F-1) ; ON • S200/DDE-13 (*A-1) ; ON	COMPONENT Y OUT (75 Ω terminated) ⊘**RV100**/DDE-13 (*D-1) TRIG : REF. VIDEO WFM or Oscilloscope 
• After Adjustment, S101-1, S200 ; OFF	**Spec. A=0 ±0.007 V (0 ±1 IRE)**

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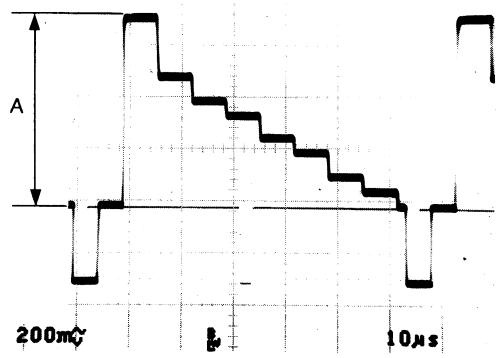
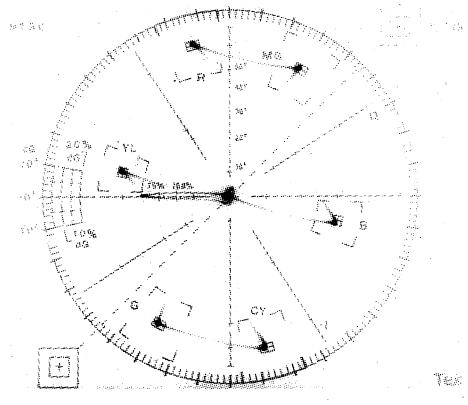
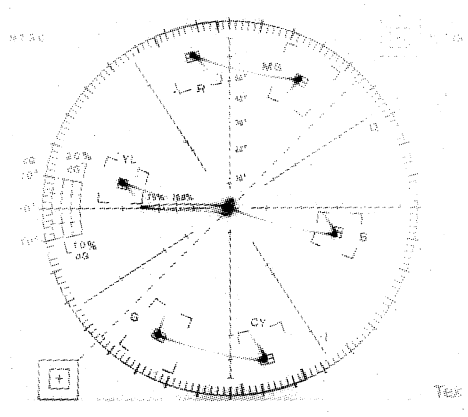
8-2-2-28. REC Composite Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/MENU ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) ⊘**RV200**/DDE-13 (*C-2) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec.** **A=0.714 ±0.007 V (100 ±1 IRE)**

8-2-2-29. REC Composite Chroma Level Adjustment

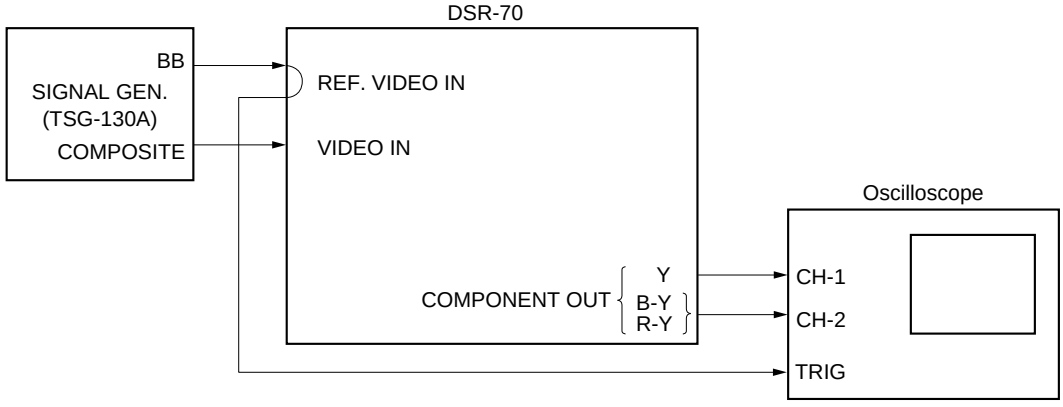
Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/MENU ; COMPOSITE **Note : The "Setup ON/OFF" setting of the DSR-70 and that a vectorscope must have been set to the same position beforehand.** Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst ⊘**PHASE control**/Vector (B) Composite Chroma Level ⊘**RV201**/DDE-13 (*C-3) ⊘**RV202**/DDE-13 (*C-2) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

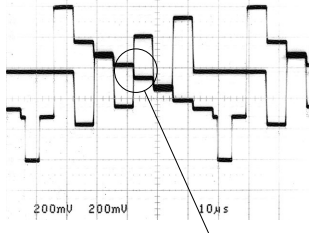
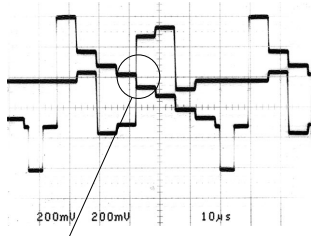
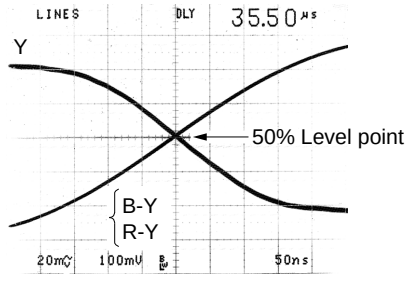
8-2-2-30. REC S VIDEO Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; 75 % Color bars • VIDEO IN select/MENU ; S VIDEO **Note : The "Setup ON/OFF" setting of the DSR-70 and that a vectorscope must have been set to the same position beforehand.** Connection 2	S VIDEO (C) OUT (75 Ω terminated) (A) Burst ⊘**PHASE control**/Vector (B) S-C Level ⊘**RV102**/DDE-13 (*F-1) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

8-2-2-31. REC Composite Y/C Delay Adjustment

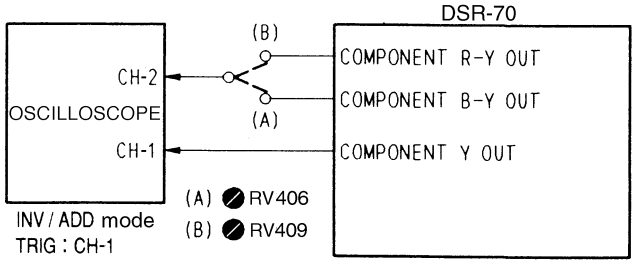
(Connection)

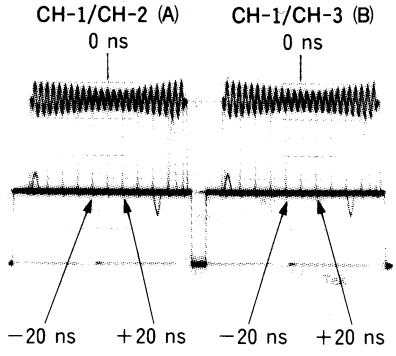


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 75 % Color bars • VIDEO IN select/MENU ; COMPOSITE	COMPONENT OUT (75 Ω terminated) B-Y : ⊘**RV404**/DDE-13 (*D-3)  R-Y : ⊘**RV407**/DDE-13 (*D-3)   **Spec. 0 ±20 ns**

8-2-2-32. REC Component Y/C Delay Adjustment

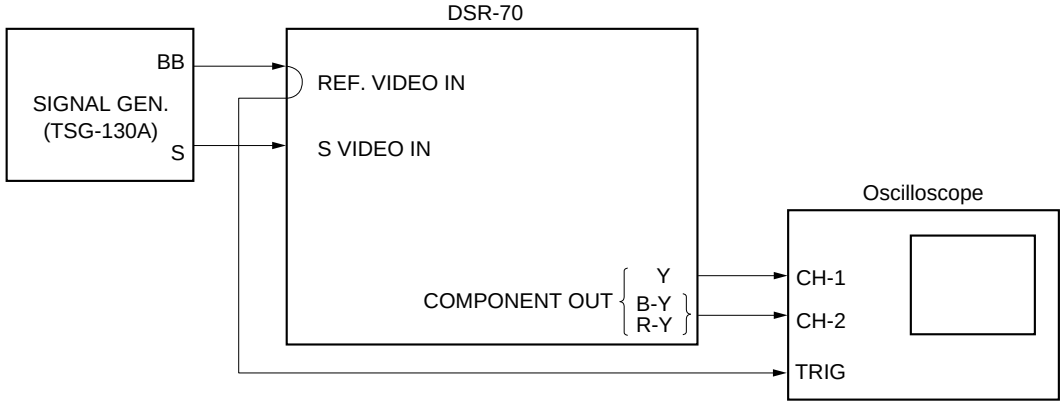
[Connection for reference] Using for an oscilloscope

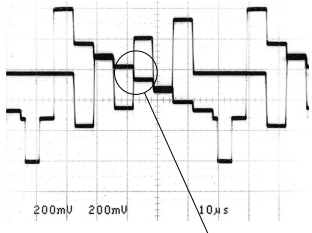
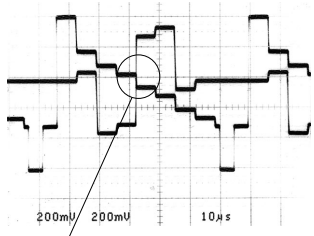
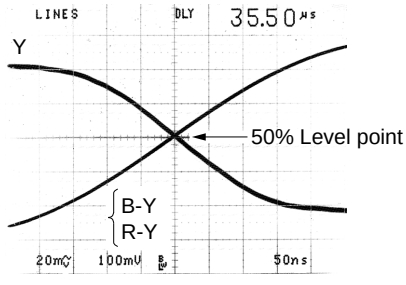


Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; Bowtie Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV406**/DDE-13 (*D-3) (B) R-Y Delay **RV409**/DDE-13 (*D-3) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

8-2-2-33. REC S VIDEO Y/C Delay Adjustment

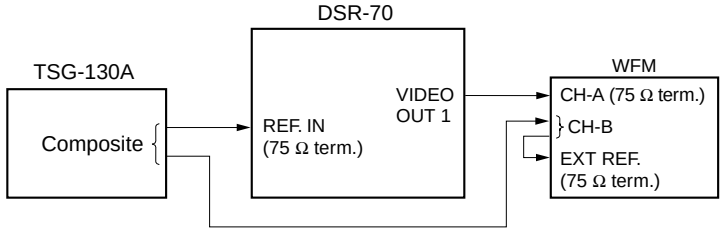
(Connection)

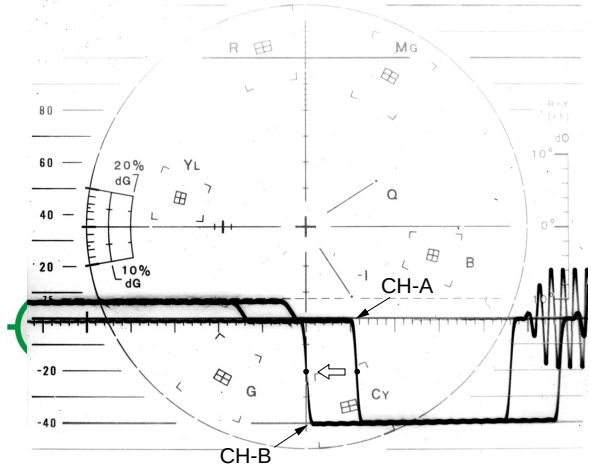


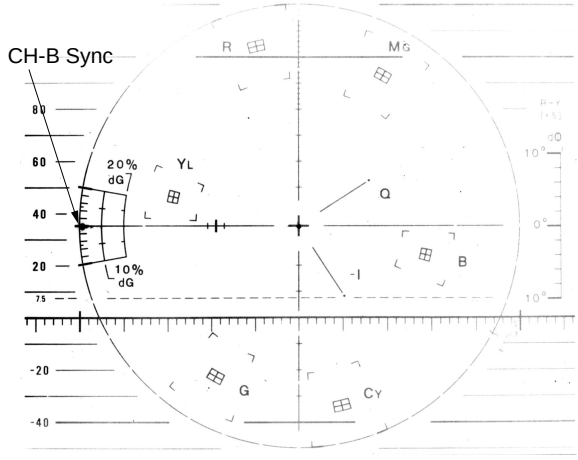
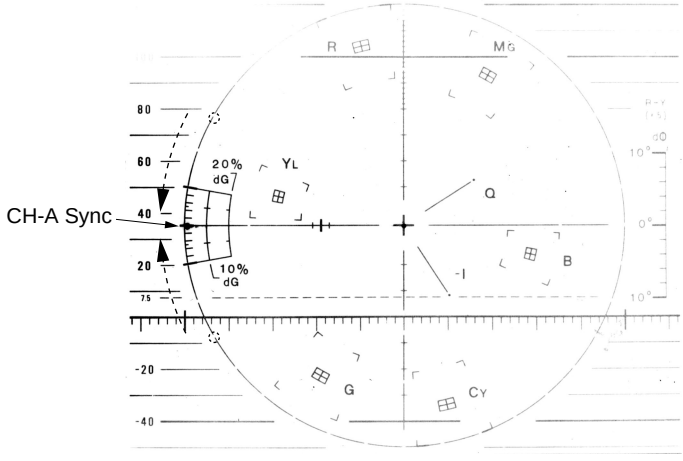
Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; 75 % Color bars • VIDEO IN select/MENU ; S VIDEO	COMPONENT OUT (75 Ω terminated) B-Y : ⊘**RV405/**DDE-13 (*D-3)  R-Y : ⊘**RV408**/DDE-13 (*D-3)   **Spec. 0 ±20 ns**

8-2-2-34. Sync Phase Adjustment

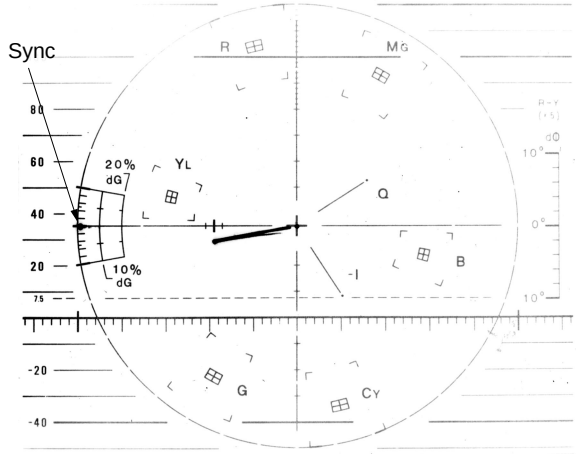
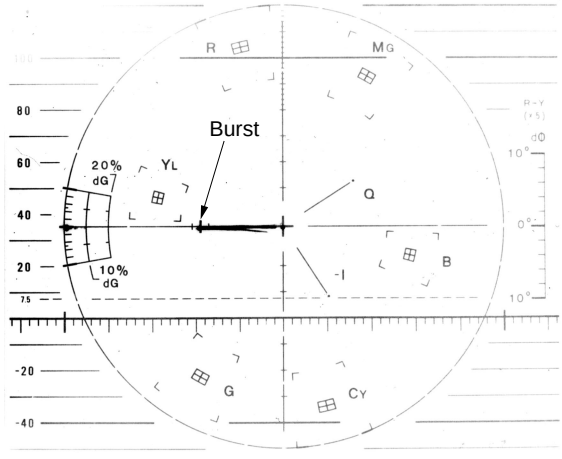
(Connection 3)



Conditions for adjustment	Adjustment • Specification
Step 1 (Coarse Adjustment) • Perform adjustment by switching CH-A and CH-B of WFM alternately.	⊘**RV100**/DEN-12 (B-1) WFM  **Spec. Perform adjustment until falling edge of CH-A sync signal agrees with falling edge of CH-B sync signal.**

Step 2 • CH-B/WFM	CH-B Sync ⊘**PHASE**/WFM SCH mode  **Spec. Adjust the CH-B sync phase to the specified position.**
Step 3 • CH-A/WFM Connection 3	CH-A Sync ⊘**RV100**/DEN-12 (B-1) SCH mode  **Spec. Perorm adjustment until CH-A sync phase agrees with that of CH-B sync using the shortest adjustment distance.**

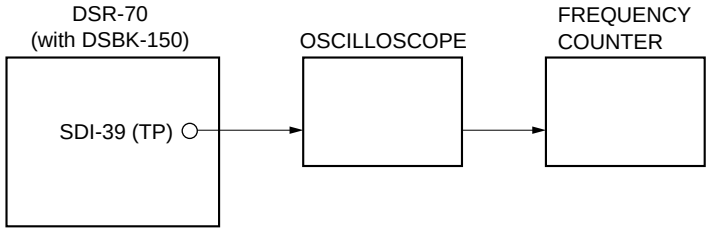
8-2-2-35. SC Phase Adjustment

Conditions for adjustment	Adjustment • Specification
Step 1 • SCH mode/WFM	⊘**PHASE**/1765 SCH mode  **Spec. Adjust the sync phase to the specified position.**
Step 2 • SCH mode/WFM Connection 3	⊘**RV101**/DEN-12 (C-1) SCH mode  **Spec. Perform adjustment until the burst signal phase agrees with the sync signal phase. (0 ±3°)**

8-2-3. SDTI (SDI-39 Board/DSBK-150)

8-2-3-1. Free Run Adjustment

(Connection)

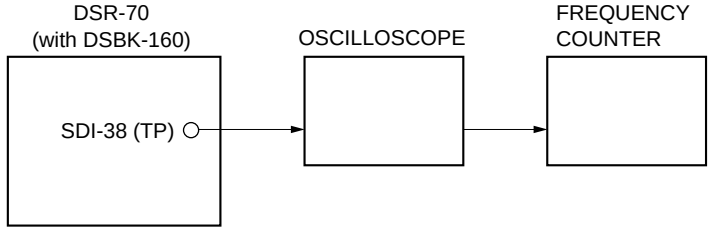


Conditions for adjustment	Adjustment • Specification
• STOP mode • Connect TP601 (D-2) to E103 (D-2). • After adjustment is complete, remove connection between TP601 (D-2) and E103 (D-2).	Step 1 TP101 (B-1) ⊘**RV101** (A-1) **Spec. 27.0 ±0.1 MHz** Step 2 TP501 (E-1) ⊘**RV501** (F-1) **Spec. 27.0 ±0.1 MHz**

8-2-4. SDI (SDI-38 Board/DSBK-160)

8-2-4-1. Free Run Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
Step 1 • STOP mode • Connect TP101 (B-1) to E101 (B-1). • After adjustment is complete, remove connection between TP101 (B-1) and E101 (B-1).	TP103 (C-1) ⊘**RV101** (A-1) **Spec. 27.0 ±0.1 MHz**
Step 2 • STOP mode • Connect TP601 (F-2) to E601 (F-2). • After adjustment is complete, remove connection between TP601 (F-2) and E601 (F-2).	TP602 (E-2) ⊘**RV601** (F-1) **Spec. 27.0 ±0.1 MHz**

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SECTION 8
ELECTRICAL ALIGNMENT (for PAL)

8-1. ELECTRICAL ALIGNMENT OVERVIEW (for PAL)

8-1-1. List of Adjustment Parts

AU-259

RV101 CH-1 EE Level ..... 8-4 (P)
RV201 CH-2 EE Level ..... 8-4 (P)
RV301 CH-1/3 PB Level ..... 8-4 (P)
RV302 CH-2/4 PB Level ..... 8-4 (P)
RV501 AGC Level ..... 8-4 (P)

DDE-13P

CT500 SPCK Error ..... 8-20 (P)
RV100 REC A/D Y Level ..... 8-25 (P)
RV102 REC S VIDEO Chroma Level ..... 8-27 (P)
RV200 REC Composite Y Level ..... 8-26 (P)
RV201 REC Composite Chroma Level ..... 8-27 (P)
RV202 REC Composite Chroma Level ..... 8-27 (P)
RV300 Composite 4Fsc PLL DC ..... 8-21 (P)
RV400 REC Y Level ..... 8-23 (P)
RV401 REC Component B-Y Level ..... 8-24 (P)
RV402 REC Component R-Y Level ..... 8-24 (P)
RV403 REC Y Clamp Level ..... 8-22 (P)
RV404 REC Composite Y/B-Y Delay ..... 8-28 (P)
RV405 REC S VIDEO Y/B-Y Delay ..... 8-30 (P)
RV406 REC Component Y/B-Y Delay ..... 8-29 (P)
RV407 REC Composite Y/R-Y Delay ..... 8-28 (P)
RV408 REC S VIDEO Y/R-Y Delay ..... 8-30 (P)
RV409 REC Component Y/R-Y Delay ..... 8-29 (P)

DEN-11P

RV101 PB Composite Y/C Delay ..... 8-14 (P)
RV102 PB Composite C/C Delay ..... 8-13 (P)
RV200 ENC R-Y Level ..... 8-12 (P)
RV201 ENC B-Y Level ..... 8-12 (P)
RV202 ENC V SC Leak ..... 8-10 (P)
RV203 ENC U SC Leak ..... 8-10 (P)
RV204 PB Burst Level ..... 8-12 (P)
RV300 COMPONENT Y OUT Level ..... 8-7 (P)
RV301 COMPONENT B-Y OUT Level ..... 8-7 (P)
RV302 COMPONENT R-Y OUT Level ..... 8-8 (P)
RV303 PB S VIDEO Chroma Level ..... 8-13 (P)
RV304 VIDEO OUT 1 Y Level ..... 8-9 (P)
RV305 VIDEO OUT 2 Y Level ..... 8-9 (P)
RV306 VIDEO OUT 1 Sync Level ..... 8-9 (P)
RV307 COMPONENT Y Sync Level ..... 8-7 (P)
RV308 PB Component Y/B-Y Delay ..... 8-15 (P)
RV309 PB Component Y/R-Y Delay ..... 8-15 (P)

DEN-12P

RV100 Sync Phase ..... 8-31 (P), 8-32 (P)
RV101 SC Phase ..... 8-33 (P)
RV102 PB INT SCH Phase ..... 8-16 (P)
RV103 REF. CF Phase ..... 8-17 (P)
RV104 ENC V (R-Y) Phase ..... 8-11 (P)
RV105 ENC U (B-Y) Phase ..... 8-11 (P)
RV106 REF. VIDEO OUT Sync Level ..... 8-19 (P)
RV107 REF. VIDEO OUT Burst Level ..... 8-19 (P)
RV108 REF. INT SCH ..... 8-19 (P)
RV200 INT SC Frequency ..... 8-6 (P)

SDI-38

RV101 Free Run ..... 8-34 (P)
RV601 Free Run ..... 8-34 (P)

SDI-39

RV101 Free Run ..... 8-34 (P)
RV501 Free Run ..... 8-34 (P)

SY-269

CV101 Character Position ..... 8-3 (P)

8-1-2. Measuring Equipment and Tools

Type of measuring equipment	Equivalent	Remarks
Oscilloscope	Tektronix 2445	150 MHz or more
Video signal generator	TSG-131A (Op.02)	
Waveform monitor	Tektronix 1761 Op. SC/1765 Op. SC	
Audio signal generator	HP339A	
Audio level meter	HP3400A/MeguroMN-446	
Frequency counter	Advantest TR5821	
Extension board	DJ-352 (J-6443-520-A)	
Analog component I/O board	DSBK-170	
Blank tape	DVM30ME, DVM30NME	On the market

8-1-3. Reference Tape for Alignment

XH5-1AP2 (8-967-999-26)
Recording contents are followings.

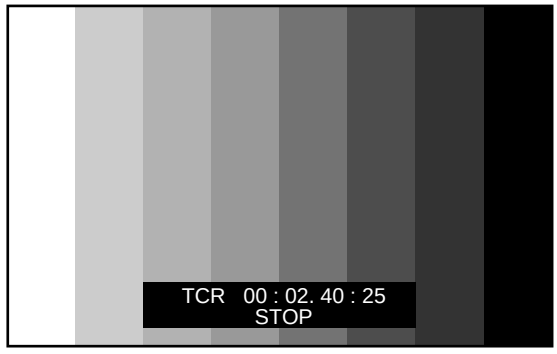
<table>
<tr><th>VIDEO</th><th>TIME CODE
(h) (m) (s)</th><th>REC
(s)</th><th colspan="2">AUDIO</th></tr>
<tr><td>Black Burst</td><td>23 : 59 : 00</td><td>60</td><td colspan="2">No Signal</td><td rowspan="10">32 kHz
4 ch</td></tr>
<tr><td>100 % Full Color Bars</td><td>00 : 00</td><td>60</td><td colspan="2">1 kHz</td></tr>
<tr><td>60 % Multi Burst</td><td>01 : 00</td><td>60</td><td colspan="2">20 Hz</td></tr>
<tr><td>Bowtie with Mod 10T</td><td>02 : 00</td><td>30</td><td colspan="2">14.5 kHz</td></tr>
<tr><td rowspan="2">Shallow Ramp</td><td>02 : 30</td><td>30</td><td colspan="2">10 kHz</td></tr>
<tr><td>03 : 00</td><td>30</td><td colspan="2">No Signal</td></tr>
<tr><td>Cross Hatch (index)</td><td>03 : 30</td><td>30</td><td colspan="2">1 kHz 0 dBFS</td></tr>
<tr><td>Line 17</td><td>04 : 00</td><td>40</td><td>1 ch</td><td rowspan="3">1 kHz</td></tr>
<tr><td>100 % Full Color Bars</td><td>04 : 40</td><td>40</td><td>2 ch</td></tr>
<tr><td rowspan="2">Quad Phase</td><td>05 : 20</td><td>40</td><td>3 ch</td></tr>
<tr><td>06 : 00</td><td>40</td><td>4 ch</td></tr>
<tr><td rowspan="2">Black Burst</td><td>06 : 40</td><td>5</td><td colspan="2" rowspan="2">No Signal</td></tr>
<tr><td>06 : 45</td><td>5</td><td rowspan="18">48 kHz
2 ch</td></tr>
<tr><td>60 % Multi Burst (for Composite)</td><td>06 : 50</td><td>60</td><td colspan="2">1 kHz</td></tr>
<tr><td>Mod 10T</td><td>07 : 50</td><td>30</td><td colspan="2">20 Hz</td></tr>
<tr><td rowspan="2">Shallow Ramp (B-Y/R-Y OFF)</td><td>08 : 20</td><td>30</td><td colspan="2">20 kHz</td></tr>
<tr><td>08 : 50</td><td>30</td><td colspan="2">10 kHz</td></tr>
<tr><td>Cross Hatch (index)</td><td>09 : 20</td><td>30</td><td colspan="2">1 kHz 0 dBFS</td></tr>
<tr><td>Chroma Noise</td><td>09 : 50</td><td>30</td><td colspan="2" rowspan="12">1 kHz</td></tr>
<tr><td>Line 17</td><td>10 : 20</td><td>30</td></tr>
<tr><td>100 % Full Color Bars</td><td>10 : 50</td><td>180</td></tr>
<tr><td>60 % Multi Burst</td><td>13 : 50</td><td>60</td></tr>
<tr><td>Mod 10T</td><td>14 : 50</td><td>30</td></tr>
<tr><td>Shallow Ramp</td><td>15 : 20</td><td>60</td></tr>
<tr><td>100 % Full Color Bars</td><td>16 : 20</td><td>100</td></tr>
<tr><td>100 % Full Color Bars (R-Y OFF)</td><td>18 : 00</td><td>180</td></tr>
<tr><td>100 % Full Color Bars (B-Y OFF)</td><td>21 : 00</td><td>180</td></tr>
<tr><td>Blanking Marker</td><td>24 : 00</td><td>180</td></tr>
<tr><td>Line 17 (R-Y OFF)</td><td>27 : 00</td><td>180</td></tr>
<tr><td>Line 17 (B-Y OFF)</td><td>30 : 00</td><td>180</td></tr>
</table>

* **Audio levels are –18 dBFS (Reference), except 1 kHz 0 dBFS part.**

8-2. ADJUSTMENT PROCEDURE (for PAL)

8-2-1. System / Audio Adjustment

8-2-1-1. Character Position Adjustment

Conditions for adjustment	Adjustment • Specification
• CHARACTER : ON • EE mode • VIDEO IN : 100 % Color bars	VIDEO 2 (SUPER) OUT (75 Ω terminated) ⊘**CV101**/SY-269 (F-3)  **Spec. Adjust the character position with a good balance with respect to color bars.**

8-2-1-2. Audio PB Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ENHANCED ↓ AU REF LEVEL ; –18 dB OUTPUT LEVEL ; +4 dB • AUDIO INPUT & PB AUDIO SW/Control panel ; PRESET • PB mode 1 kHz Ref. level (32 kHz, 4CH) / XH5-1AP2 (03:30-04:00)	AUDIO OUPUT 1/3 & 2/4 (600 Ω loaded) CH-1/3 ; ⊘**RV301**/AU-259 (D-3) CH-2/4 ; ⊘**RV302**/AU-259 (C-3) **Spec. +4.0 ±0.3 dBu**

8-2-1-3. Audio EE Level Adjustment

Conditions for adjustment	Adjustment • Specification
• MENU ENHANCED ↓ AU REF LEVEL ; –18 dB OUTPUT LEVEL ; +4 dB • AUDIO INPUT & PB AUDIO SW/Control panel ; PRESET • AUDIO INPUT CH-1/CH-2 ; 1 kHz, +4 dBu • EE mode	AUDIO OUTPUT 1/3 & 2/4 (600 Ω loaded) CH-1 ; ⊘**RV101**/AU-259 (F-2) CH-2 ; ⊘**RV201**/AU-259 (E-2) **Spec. +4.0 ±0.5 dBu**

8-2-1-4. Audio AGC Adjustment

Conditions for adjustment	Adjustment • Specification
• CH-1, 2 AGC/SUB LCD MENU ; AGC ON • AUDIO INPUT & PB AUDIO SW/Control panel ; PRESET • AUDIO INPUT switch CH-1, 2/Rear panel ; –60 dBu • AUDIO INPUT CH-1/CH-2 ; 1 kHz, –20 dBu • EE mode * Reset the setup after adjustment is completed.	AUDIO OUTPUT 1/3 & 2/4 (600 Ω loaded) CH-1/CH-2 common specifications ⊘**RV501**/AU-259 (F-3) **Spec. +9.0 ±0.3 dBu**

8-2-2. Video Adjustment

[Switch Setting]

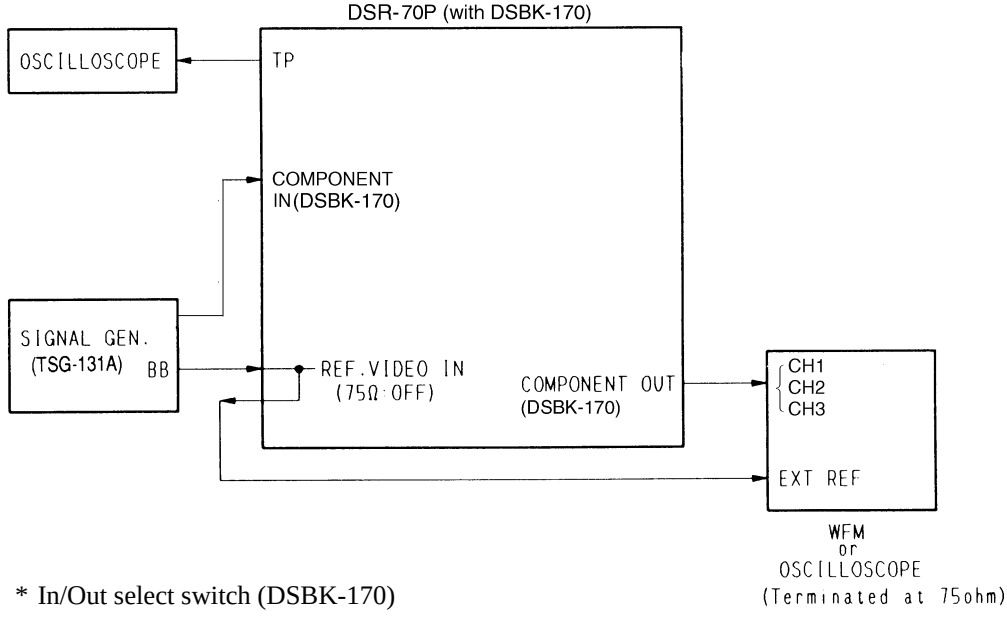
This setting should be fixed in position unless otherwise specified.

LOCAL/REMOTE ; LOCAL
CHARACTER ; ON

[Connection]

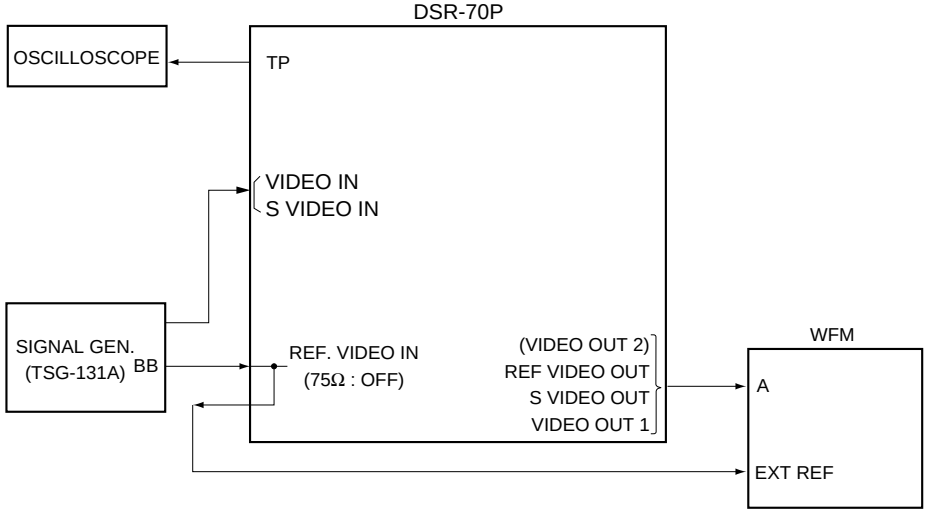
Connect some equipment as following unless otherwise specified.

(Connection 1)



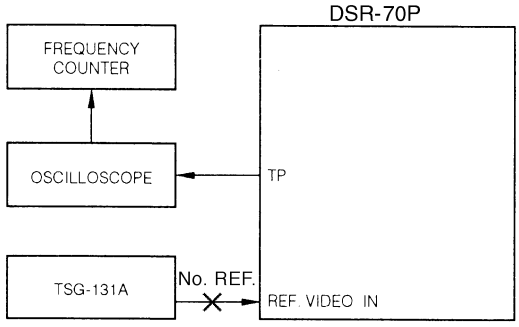
* In/Out select switch (DSBK-170)
REC/EE ; In
PB ; Out

(Connection 2)



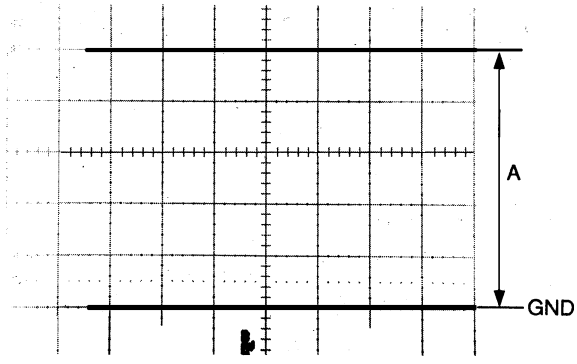
8-2-2-1. INT SC Frequency Adjustment

(Connection)

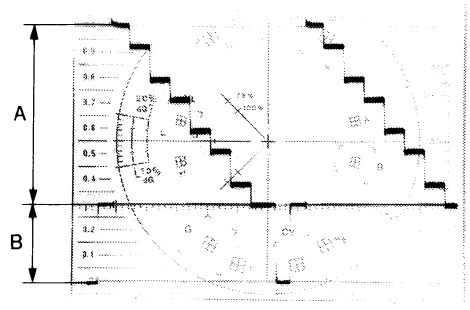


Conditions for adjustment	Adjustment • Specification
• STOP mode • REF. VIDEO IN ; No signal	TP200/DEN-12P (*D-3) ⊘**RV200**/DEN-12P (*D-2) Frequency counter **Spec. f=4,433,618 ±10 Hz**

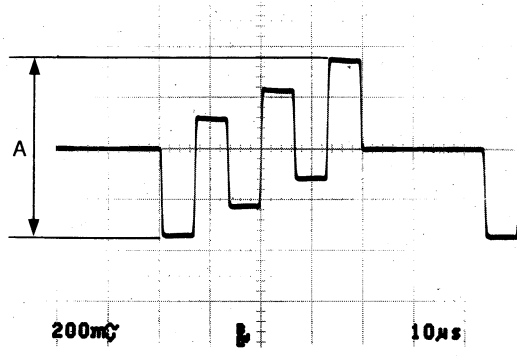
8-2-2-2. HCK Check

Conditions for adjustment	Adjustment • Specification
• STOP mode Connection 1 or 2	TP201/DEN-12P (*D-2) Oscilloscope  **Spec. A=2.5 ±0.5 Vdc**

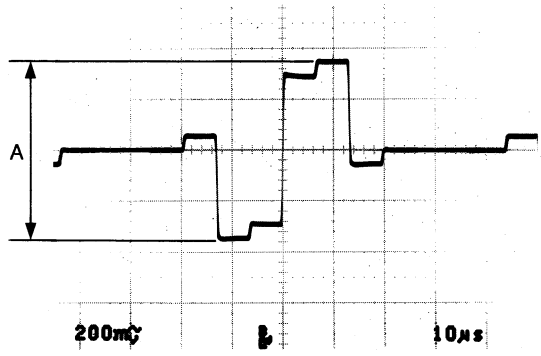
8-2-2-3. COMPONENT Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 1	COMPONENT Y OUT (75 Ω terminated) (A) Y/S-Y Level ⊘**RV300**/DEN-11P (*E-1) (B) Y/S-Y SYNC ⊘**RV307**/DEN-11P (*F-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0 700 ±0.007 V** **B=0.300 ±0.003 V**

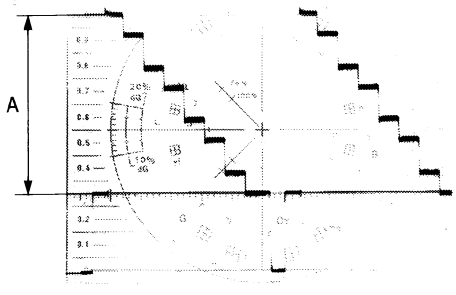
8-2-2-4. COMPONENT B-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ⊘**RV301**/DEN-11P (*F-2) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

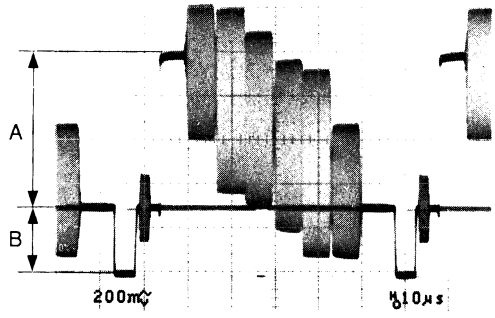
8-2-2-5. COMPONENT R-Y OUT Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ⊘**RV302**/DEN-11P (*F-2) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

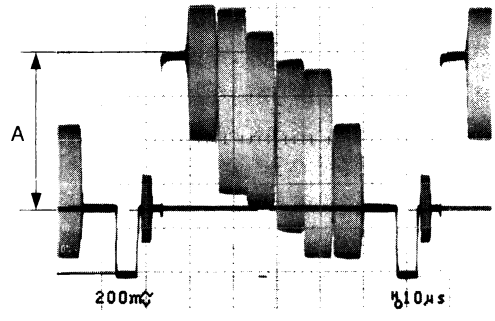
8-2-2-6. S VIDEO OUT Y Level Check

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	S VIDEO (Y) OUT (75 Ω terminated) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

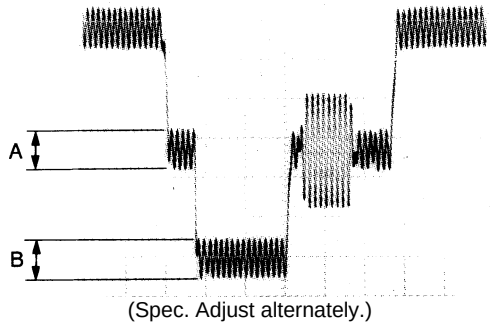
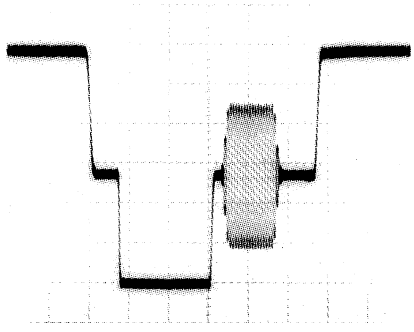
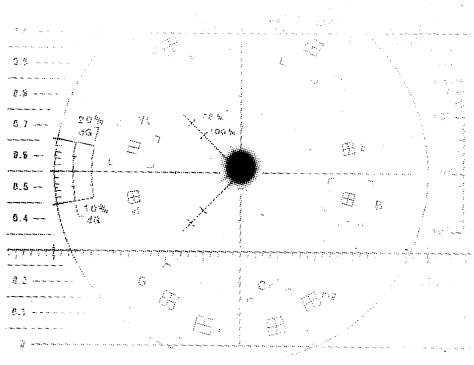
8-2-2-7. VIDEO OUT 1 Y/SYNC Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Video Level ⊘**RV304**/DEN-11P (*F-4) (B) Sync Level ⊘**RV306**/DEN-11P (*F-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V** **B=0.300 ±0.003 V**

8-2-2-8. VIDEO OUT 2 Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	VIDEO OUT 2 (75 Ω terminated) ⊘**RV305**/DEN-11P (*F-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

8-2-2-9. ENC SC Leak Adjustment

Conditions for adjustment	Adjustment • Specification
Step 1 • PB mode 100 % Color bars/XH5-1AP2 • Set the time axis of the WFM to magnification mode Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) V SC Leak ⊘**RV202**/DEN-11P (E-1) (B) U SC Leak ⊘**RV203**/DEN-11P (E-1) TRIG : REF. VIDEO WFM Before adjustment  (Spec. Adjust alternately.) ⇩ After adjustment  **Spec. Minimize the A, B. A, B≦0.007 V**
Step 2 (Check) • PB mode 100 % Color bars/XH5-1AP2 Connection 2	VIDEO OUT 1 (75 Ω terminated) TRIG : REF. VIDEO Vector  **Spec. Maximum the gain of the Vector and check the dot is at center.**

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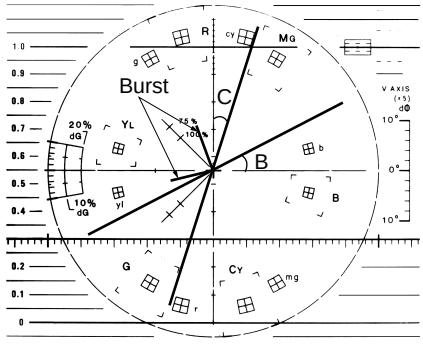
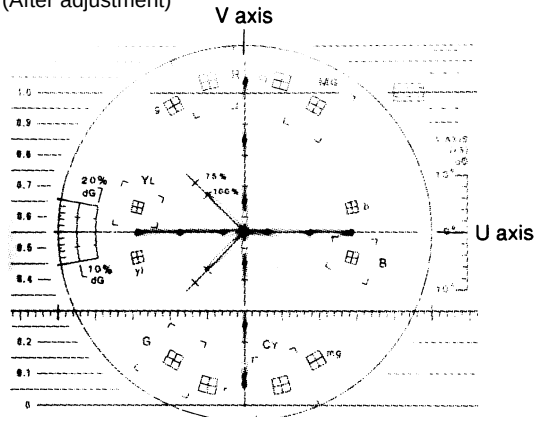
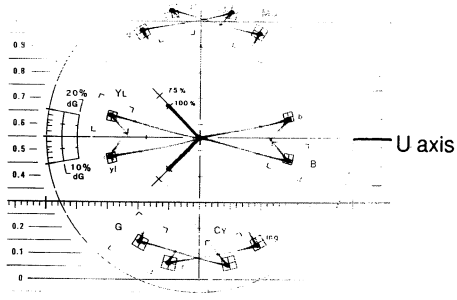
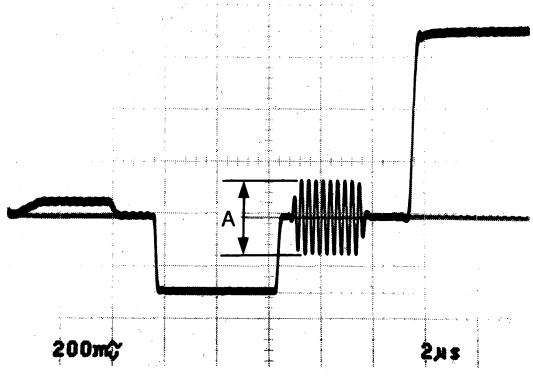
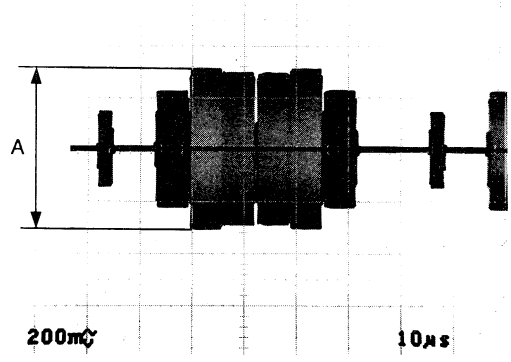
8-2-2-10. U-V Axis (B-Y, R-Y) Phase Adjustment

Conditions for adjustment	Adjustment • Specification
[Flow] (A) Burst preset • PB mode Quad Phase/XH5-1AP2 (05:20-06:00) (B) U-axis phase adjustment • PB mode Quad Phase/XH5-1AP2 (05:20-06:00) (C) V-axis phase adjustment • PB mode Quad Phase/XH5-1AP2 (05:20-06:00) Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst preset ⊘**PHASE control**/Vector (B) U-axis (HUE) ⊘**RV105**/DEN-12P (C-1) (C) V-axis (U/V OFFSET) ⊘**RV104**/DEN-12P (C-1) TRIG : REF. VIDEO Vector (Before adjustment)  (After adjustment)  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) Set the dots of the B-Y on the U axis of the vector.** **(C) Set the dots of the R-Y on the V axis of the vector.** **B, C=0 ±0.5 °**

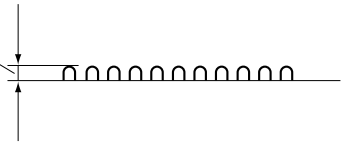
8-2-2-11. PB VIDEO OUT 1 Chroma/Burst Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	VIDEO OUT 1 (75 Ω terminated) Step 1 C level (A) Burst ⊘**PHASE control**/Vector (B) ENC R-Y Level ⊘**RV200**/DEN-11P (E-1) ENC B-Y Level ⊘**RV201**/DEN-11P (D-1) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector by adjustment RV200 and RV201 alternately.** Step 2 Burst level ⊘**RV-204**/DEN-11 (D-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.300 ±0.003 V**

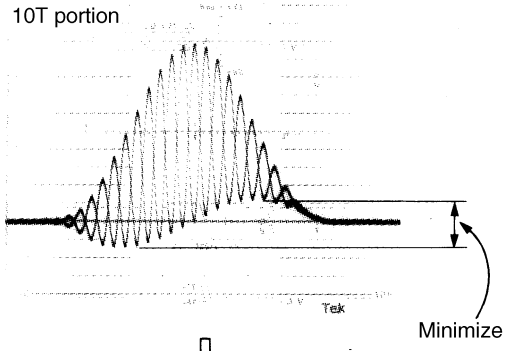
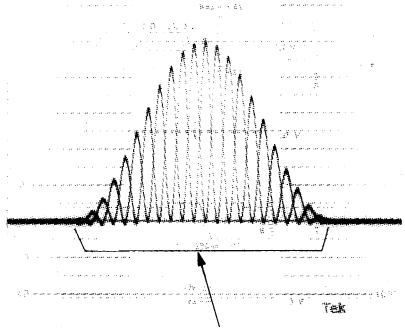
8-2-2-12. PB S VIDEO Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	S VIDEO (C) OUT (75 Ω terminated) ⊘**RV303**/DEN-11P (*E-4) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.885 ±0.006 V**

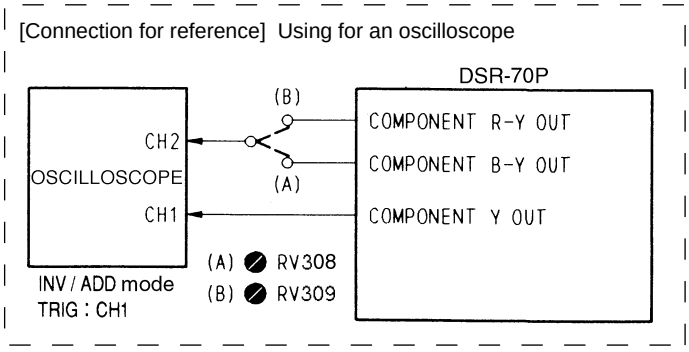
8-2-2-13. PB Composite C/C Delay Adjustment

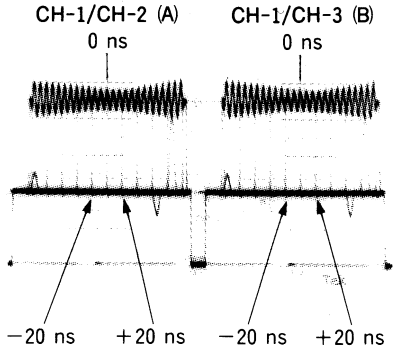
Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1AP2 (02:00-02:30) Connection 2	CH-1/Oscilloscope TP101/DEN-11P (*D-3) ⊘**RV102**/DEN-11P (C-1) CH-2/Oscilloscope TP102/DEN-11P (*D-2) Oscilloscope Vertical mode : INV +ADD **Spec.** Minimize 

8-2-2-14. PB Composite Y/C Delay Adjustment

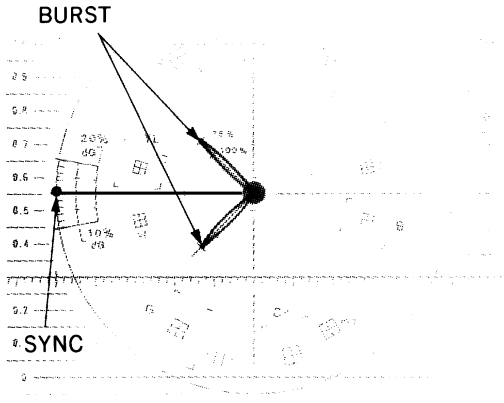
Conditions for adjustment	Adjustment • Specification
• PB mode Mod 10T/XH5-1AP2 (07:50-08:20) Connection 2	VIDEO OUT 1 (75 Ω terminated) ⊘**RV101**/DEN-11P (C-1) TRIG : INT/WFM WFM Before adjustment 10T portion  ⇩ After adjustment  **Spec.** Flat

8-2-2-15. PB Component Y/C Delay Adjustment



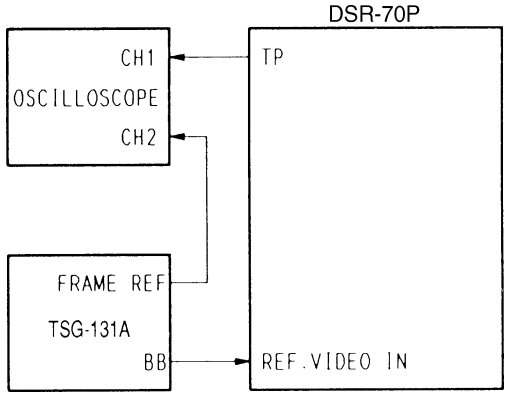
Conditions for adjustment	Adjustment • Specification
• PB mode Bowtie/XH5-1AP2 (02:00-02:30) Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV308**/DEN-11P (*E-3) (B) R-Y Delay **RV309**/DEN-11P (*E-3) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

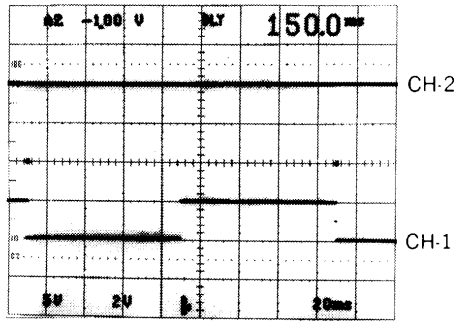
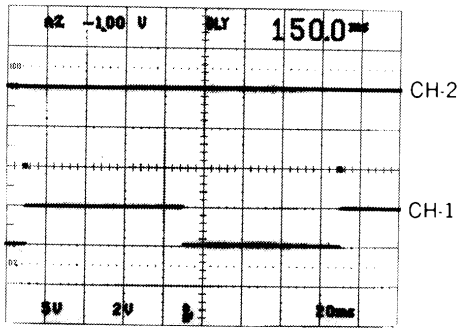
8-2-2-16. PB INT SCH Phase Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 • REF. VIDEO IN ; No signal • After adjustment, connect REF. VIDEO IN. Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst Preset ⊘**PHASE control**/Vector (B) INT SC ⊘**RV102**/DEN-12P (C-1) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the center of the bursts (SCH=0 °).**

8-2-2-17. REF. CF Phase Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EJECT mode	CH-1/Oscilloscope TP203/DEN-12P (D-2) ⊘**RV103**/DEN-12P (S-1) CH-2/Oscilloscope FRAME PULSE/TSG-131A TRIG : FRAME PULSE (CH-2) Oscilloscope (NG)  ⇩ (OK) 

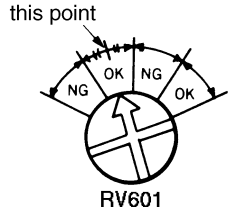
Spec. (1) Turn RV103 counterclockwise fully.

(2) When RV103 is turned clockwise gradually, the phase condition between CH-1 and CH-2 changes from NG to OK or OK to NG.

(3) In case of the pattern of change is started from NG as shown in the following illustration, set RV103 to mechanical center of range of first OK.

NG → OK → NG → OK

the mechanical center of this range

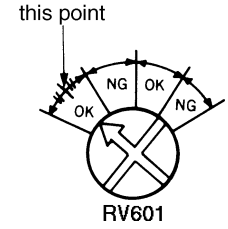


RV601

(4) In case of the pattern of change is started from OK as shown in the following illustration, set RV103 to mechanical center of range of first OK.

OK → NG → OK → NG

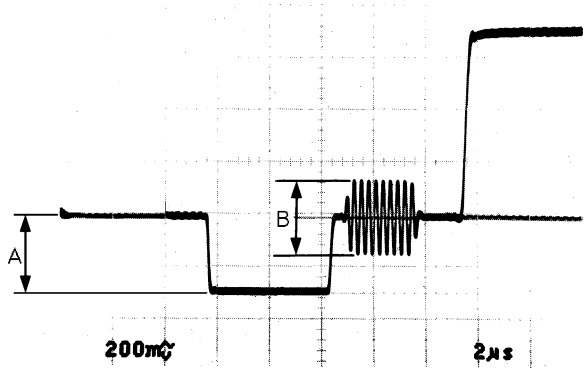
the mechanical center of this range



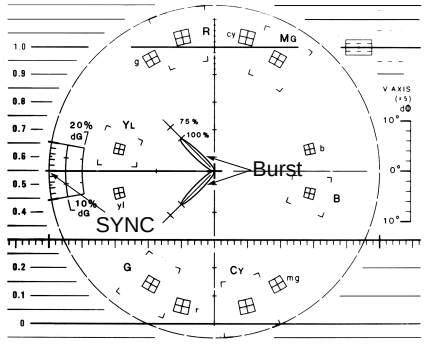
RV601

*** If the range of first OK is extremely narrow, set to mechanical center of range of second OK.**

8-2-2-18. REF. VIDEO OUT Sync/Burst Level Adjustment

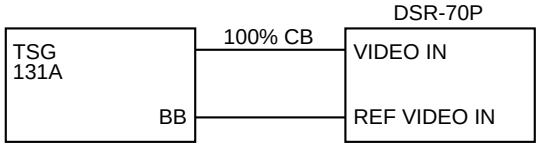
Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Sync Level ⊘**RV106**/DEN-12P (*E-3) (B) Burst Level ⊘**RV107**/DEN-12P (*E-3) TRIG : INT/WFM WFM or Oscilloscope  **Spec. A, B=0.300 ±0.003 V**

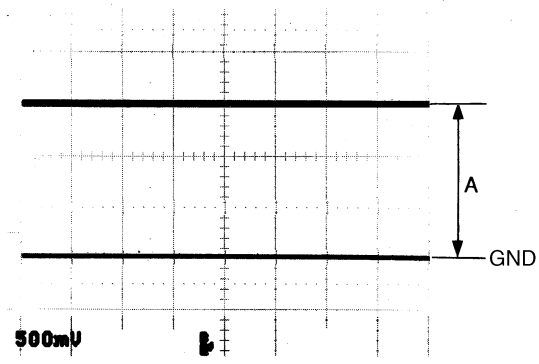
8-2-2-19. REF. Internal SCH Adjustment

Conditions for adjustment	Adjustment • Specification
• PB mode 100 % Color bars/XH5-1AP2 • REF. VIDEO IN ; No signal • After adjustment is completed, re-connect the REF. VIDEO IN. Connection 2	REF. VIDEO OUT (75 Ω terminated) (A) Burst Preset ⊘**PHASE control**/Vector (B) Sync Phase ⊘**RV108**/DEN-12P (*E-3) TRIG : INT/WFM SCH mode  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) The SYNC should be in the center of the bursts (SCH=0 ±3 °).**

8-2-2-20. SPCK Error Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars	TP500/DDE-13P (*G-4) ⊘**CT500**/DDE-13P (*G-4) Oscilloscope  **Spec. A=1.5 ±0.1 Vdc**

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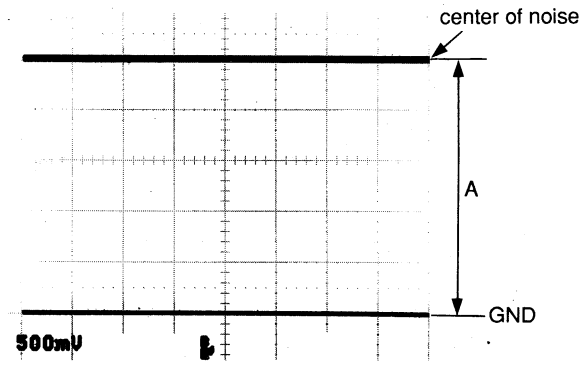
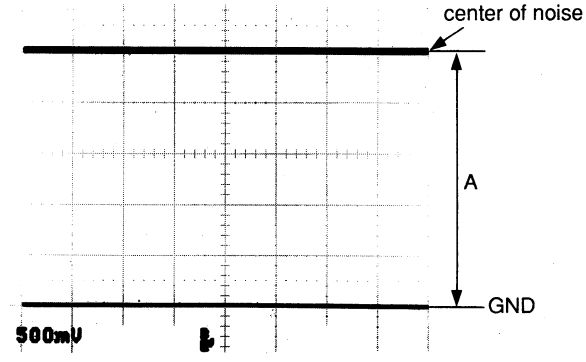
8-2-2-21. Composite 4Fsc PLL DC Check/Adjustment

<table>
<tr><th>Conditions for adjustment</th><th>Adjustment • Specification</th></tr>
<tr><td rowspan="2">• EE mode
• VIDEO IN ; Composite 100 % Color bars
• VIDEO IN select/MENU ; COMPOSITE

Connection 2</td><td>TP301/DDE-13P (*B-5)

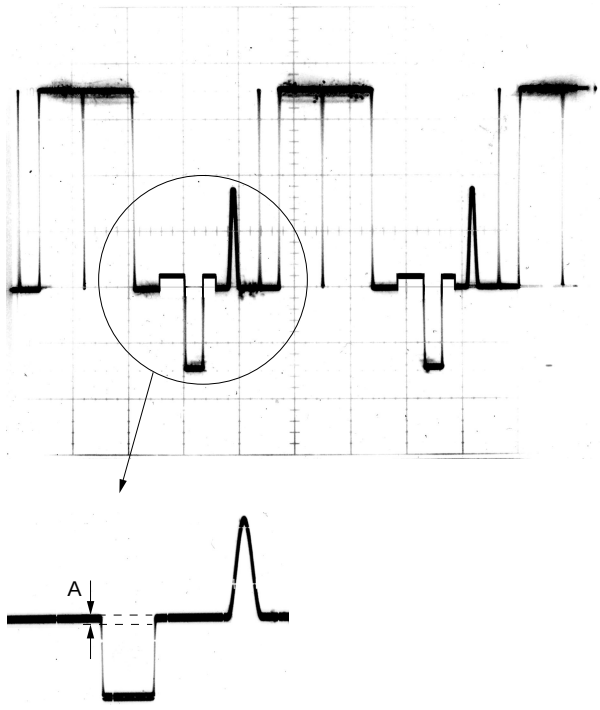
[Check]
Oscilloscope
 

Spec. A=2.5 ±0.1 Vdc</td></tr>
<tr><td>TP300/DDE-13P (*A-4)

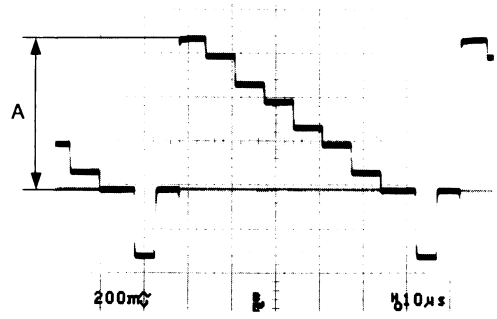
⊘RV300/DDE-13P (*B-5)
Oscilloscope
 

Spec. A=2.5 ±0.5 Vdc</td></tr>
</table>

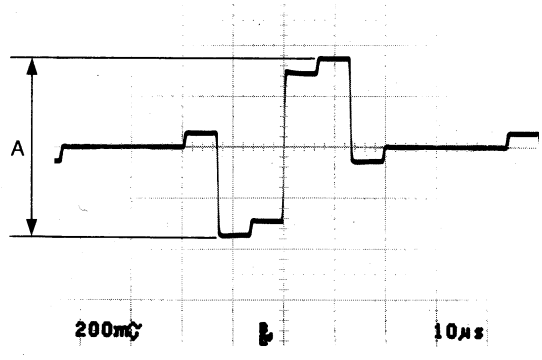
8-2-2-22. REC Y Clamp Level Adjustment

Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; Pluse & Bar Connection 1	COMPONENT Y OUT (75 Ω terminated) ⊘**RV403**/DDE-13P (*E-4) WFM or Oscilloscope  **Spec. A=Minimize the level difference A at Pedestal.**

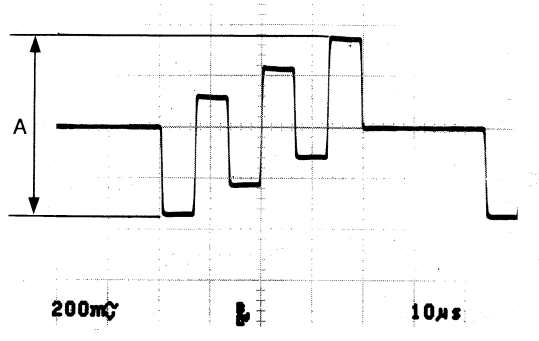
8-2-2-23. REC Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; 100 % Color bars Connection 1	COMPONENT Y OUT (75 Ω terminated) ⊘**RV400**/DDE-13P (*E-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

8-2-2-24. REC Component R-Y Level Adjustment

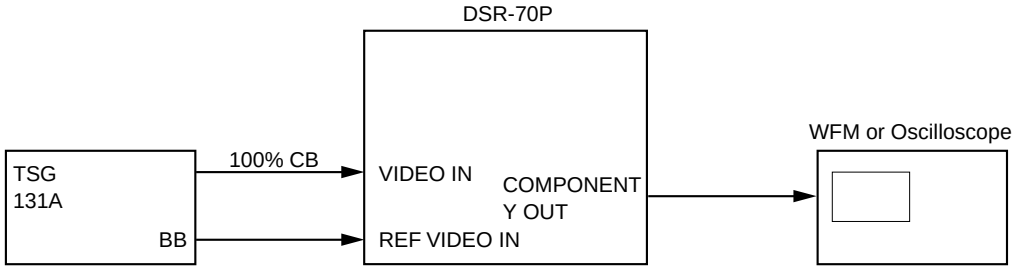
Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; 100 % Color bars Connection 1	COMPONENT R-Y OUT (75 Ω terminated) ⊘**RV402**/DDE-13P (*D-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

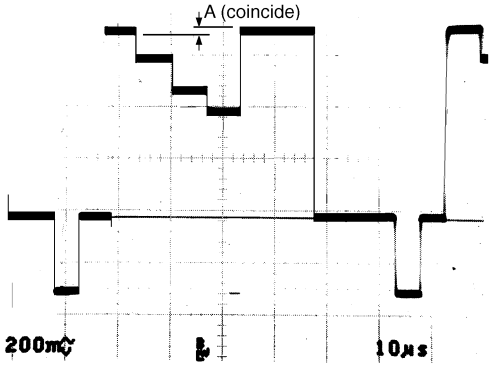
8-2-2-25. REC Component B-Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; 100 % Color bars Connection 1	COMPONENT B-Y OUT (75 Ω terminated) ⊘**RV401**/DDE-13P (*D-3) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0.700 ±0.007 V**

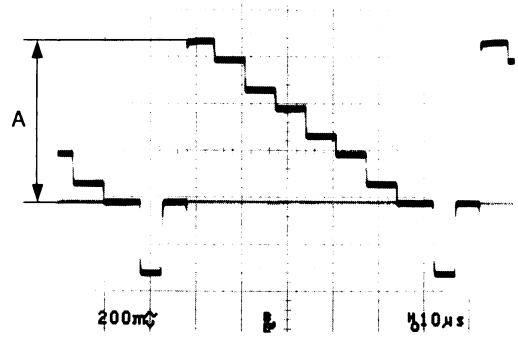
8-2-2-26. REC A/D Y Level Adjustment

(Connection)

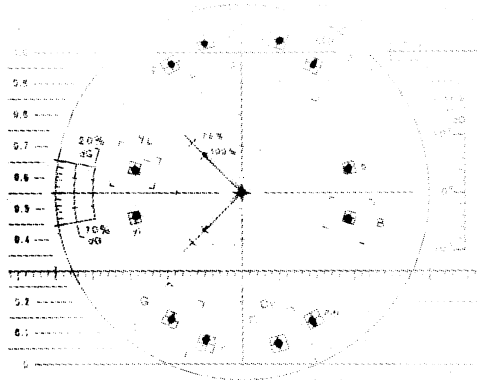


Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/MENU ; COMPOSITE • S101-1/SV-203 (F-1) ; ON • S200/DDE-13P (*A-1) ; ON • After Adjustment, S101-1, S200 ; OFF	COMPONENT Y OUT (75 Ω terminated) ⊘**RV100**/DDE-13P (*D-1) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec. A=0 ±0.007 V**

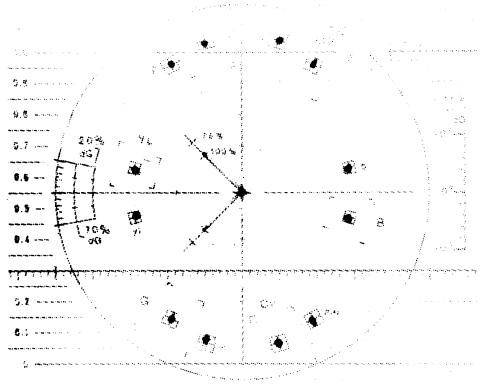
8-2-2-27. REC Composite Y Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/MENU ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) ⊘**RV200**/DDE-13P (℃-2) TRIG : REF. VIDEO WFM or Oscilloscope  **Spec.** **A=0.700 ±0.007 V**

8-2-2-28. REC Composite Chroma Level Adjustment

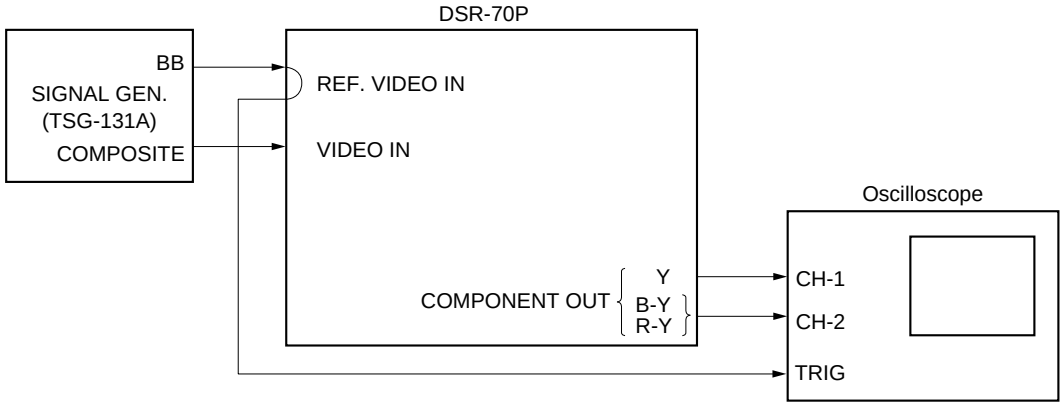
Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/MENU ; COMPOSITE Connection 2	VIDEO OUT 1 (75 Ω terminated) (A) Burst ⊘**PHASE control**/Vector (B) Composite Chroma Level ⊘**RV201**/DDE-13P (※C-3) ⊘**RV202**/DDE-13P (※C-2) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

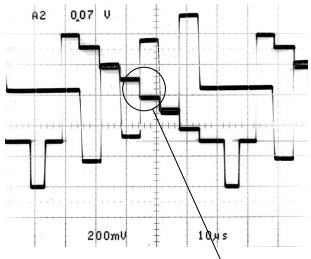
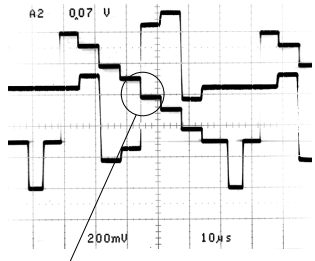
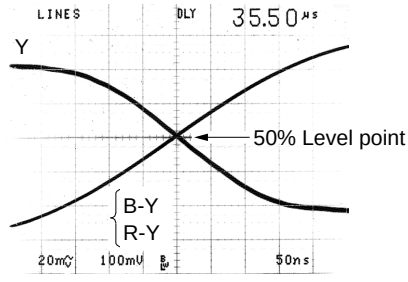
8-2-2-29. REC S VIDEO Chroma Level Adjustment

Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/MENU ; S VIDEO Connection 2	S VIDEO (C) OUT (75 Ω terminated) (A) Burst ⊘**PHASE control**/Vector (B) S-C Level ⊘**RV102**/DDE-13P (※F-1) TRIG : REF. VIDEO Vector  **Spec. (A) Set the dot of the burst in the right position on the scale.** **(B) All dots should be inside the "⊞" mark on the vector.**

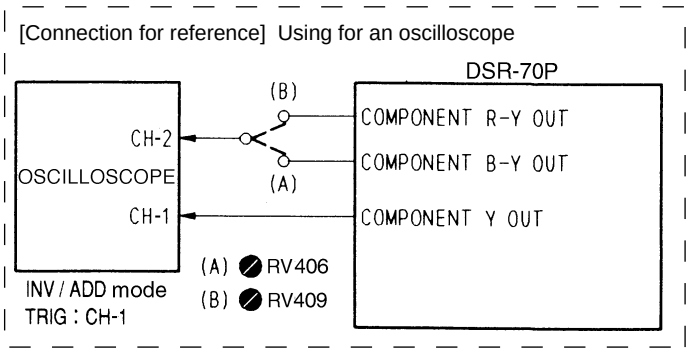
8-2-2-30. REC Composite Y/C Delay Adjustment

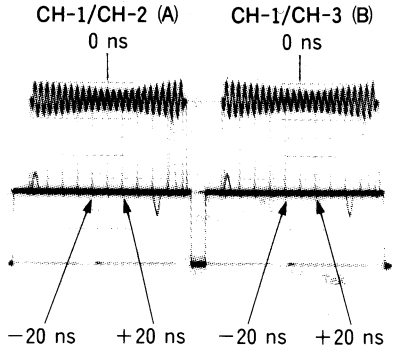
(Connection)



Conditions for adjustment	Adjustment • Specification
• EE mode • VIDEO IN ; 100 % Color bars • VIDEO IN select/MENU ; COMPOSITE	COMPONENT OUT (75 Ω terminated) B-Y : ⊘**RV404**/DDE-13P (*D-3)  R-Y : ⊘**RV407**/DDE-13P (*D-3)   **Spec. 0 ±20 ns**

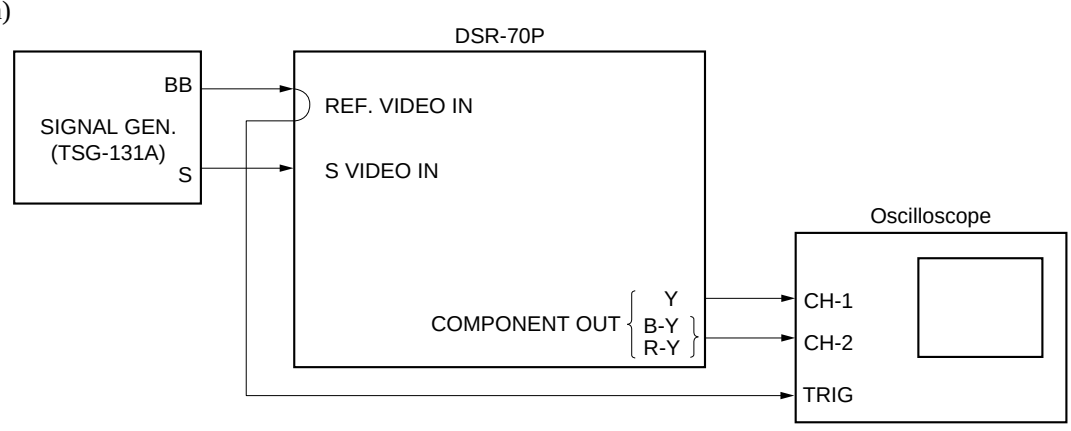
8-2-2-31. REC Component Y/C Delay Adjustment

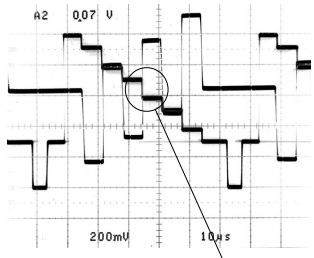
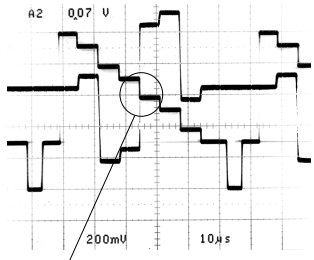
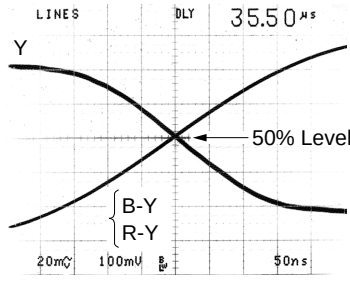


Conditions for adjustment	Adjustment • Specification
• OA mode Record the specified signal on a blank tape, and play back the recorded segment. • COMPONENT IN ; Bowtie Connection 1	COMPONENT OUT (75 Ω terminated) (A) B-Y Delay **RV406**/DDE-13P (*D-3) (B) R-Y Delay **RV409**/DDE-13P (*D-3) TRIG : EXT/WFM Bowtie mode  **Spec. Set the each Bowtie dip point of (A) and (B) on the center marker.** **0 ±20 ns**

8-2-2-32. REC S VIDEO Y/C Delay Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
• EE mode • S VIDEO IN ; 100 % Color bars • VIDEO IN select/MENU ; S VIDEO	COMPONENT OUT (75 Ω terminated) B-Y : ⊘**RV405/**DDE-13P (*D-3)  R-Y : ⊘**RV408**/DDE-13P (*D-3)   **Spec. 0 ±20 ns**

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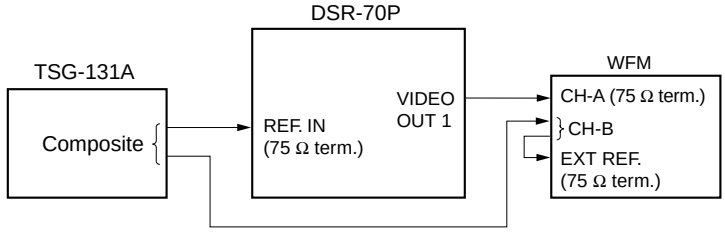
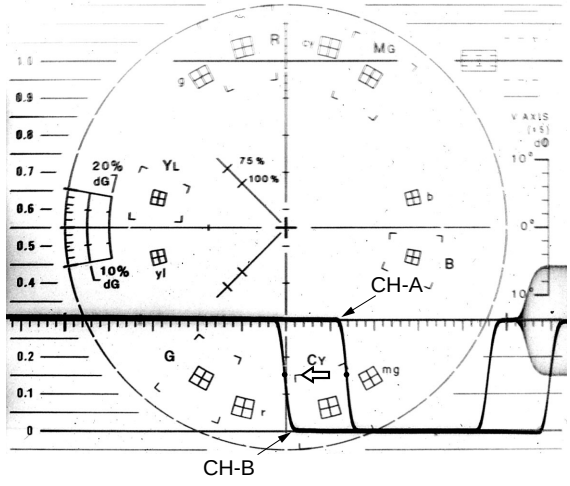
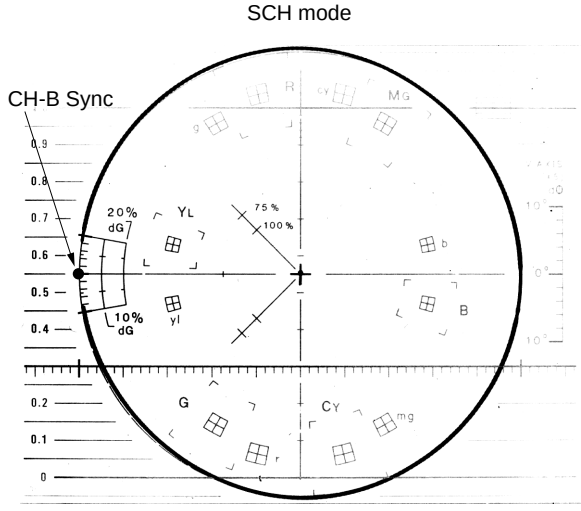
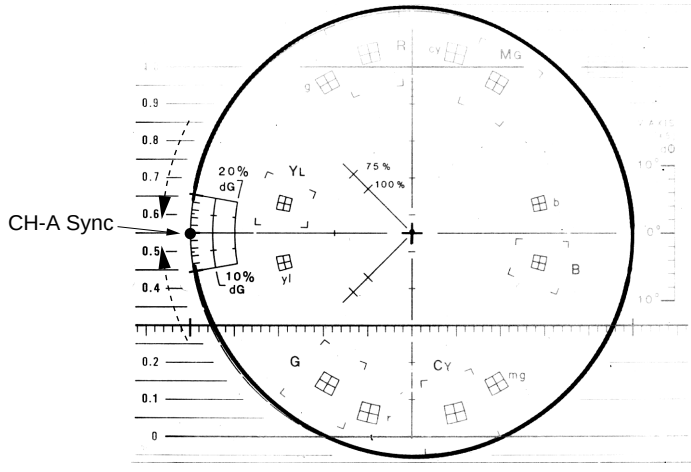
8-2-2-33. Sync Phase Adjustment

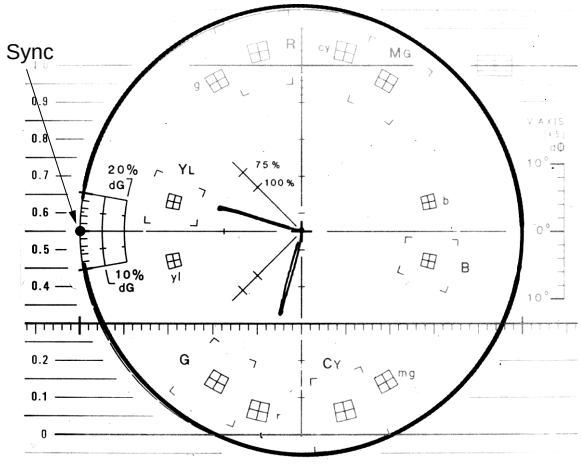
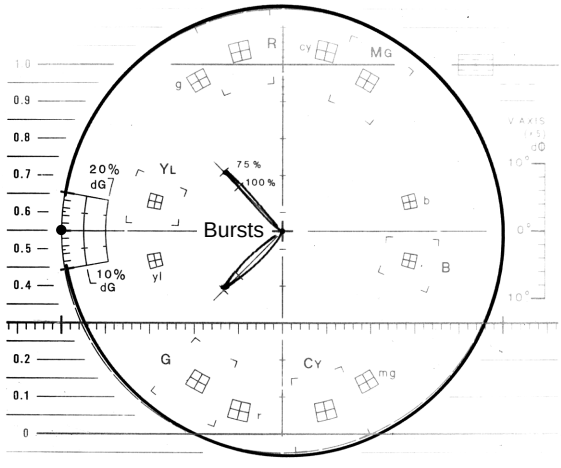
(Connection 3)



Conditions for adjustment	Adjustment • Specification
Step 1 (Coarse Adjustment) • Perform adjustment by switching CH-A and CH-B of WFM alternately.	⊘**RV100**/DEN-12P (B-1) WFM  **Spec. Perform adjustment until falling edge of CH-A sync signal agrees with falling edge of CH-B sync signal.**

Step 2 • CH-B/WFM	CH-B Sync ⊘**PHASE**/WFM SCH mode  **Spec. Adjust the CH-B sync phase to the specified position.**
Step 3 • CH-A/WFM Connection 3	CH-A Sync ⊘**RV100**/DEN-12P (B-1) SCH mode  **Spec. Perorm adjustment until CH-A sync phase agrees with that of CH-B sync using the shortest adjustment distance.**

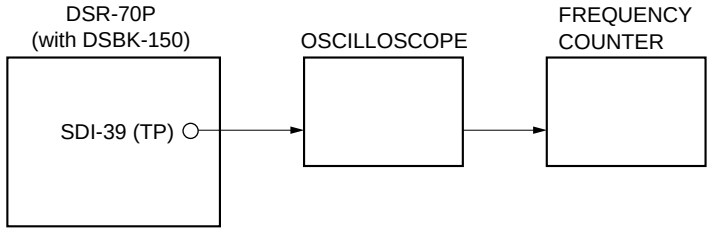
8-2-2-34. SC Phase Adjustment

Conditions for adjustment	Adjustment • Specification
Step 1 • SCH mode/WFM	⊘**PHASE**/1765 SCH mode  **Spec. Adjust the sync phase to the specified position.**
Step 2 • SCH mode/WFM Connection 3	⊘**RV101**/DEN-12P (C-1) SCH mode  **Spec. Adjust the burst signal phases with respect to the sync signal. (0 ±3°)**

8-2-3. SDTI (SDI-39 Board/DSBK-150)

8-2-3-1. Free Run Adjustment

(Connection)

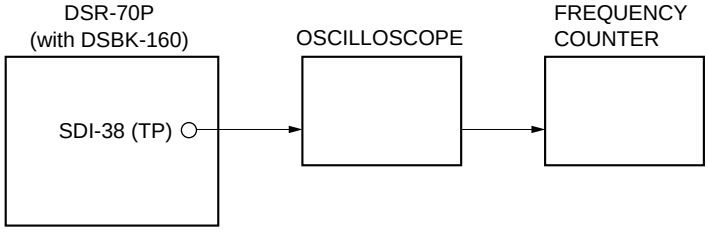


Conditions for adjustment	Adjustment • Specification
• STOP mode • Connect TP601 (D-2) to E103 (D-2). • After adjustment is complete, remove connection between TP601 (D-2) and E103 (D-2).	Step 1 TP101 (B-1) ⊘**RV101** (A-1) **Spec. 27.0 ±0.1 MHz** Step 2 TP501 (E-1) ⊘**RV501** (F-1) **Spec. 27.0 ±0.1 MHz**

8-2-4. SDTI (SDI-38 Board/DSBK-160)

8-2-4-1. Free Run Adjustment

(Connection)



Conditions for adjustment	Adjustment • Specification
Step 1 • STOP mode • Connect TP101 (B-1) to E101 (B-1). • After adjustment is complete, remove connection between TP101 (B-1) and E101 (B-1).	TP103 (C-1) ⊘**RV101** (A-1) **Spec. 27.0 ±0.1 MHz**
Step 2 • STOP mode • Connect TP601 (F-2) to E601 (F-2). • After adjustment is complete, remove connection between TP601 (F-2) and E601 (F-2).	TP602 (E-2) ⊘**RV601** (F-1) **Spec. 27.0 ±0.1 MHz**

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SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

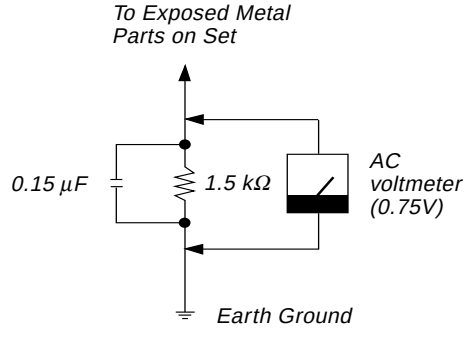

Fig A. Using an AC voltmeter to check AC leakage.

(UC model only)

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